

Final Report
Chugach Regional Resources Commission
Climate Change Adaptation Planning Project



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Brenda Gail Bergman and Jeff Hetrick

Goals

Primary goals of the Chugach Regional Resources Commission (CRRC) adaptation planning project were:

1. To initiate a climate change adaptation planning process by gaining an understanding of the role and responsibility of the various federal and state agencies that deal with climate change issues, and the application of their programs to Tribes in the Chugach Region, and
2. To document Tribal observations and concerns regarding climate change.
3. To identify priorities of member tribes for Phase II (Vulnerability Assessment) of the climate change adaptation planning process.

Accomplishments

CRRC addressed these goals by identifying and meeting with representatives from agencies and organizations addressing climate change in Alaska, facilitating meetings with tribal representatives on climate change, and attending climate change-related trainings and workshops. Related accomplishments include that we:

- Identified institutions and key individuals from various federal, state, and nonprofit institutions that address climate change in Alaska, and conducted interviews with key individuals in these institutions.
- Developed a vision and set of priority actions for the next phase of CRRC's climate change program.
- Prepared a guide to climate change-related institutions and resources.
- Conducted meetings with tribal representatives to acquire their observations of climate change and other environmental and social changes over recent decades. We also discussed tribes' current challenges, opportunities, and arrangements for managing natural resources, and explored how climate change work may fit into existing plans. We shared information regarding scientific findings about climate impacts in South-Central Alaska.
- Attended trainings and workshops to improve CRRC's capacity, awareness, and engagement in regional climate change initiatives. These include: Alaska Science Symposium, Alaska Marine Science Symposium, EPA Climate Change training, Vine Deloria Jr. Symposium (which included a focus on Climate Change), Pacific Northwest Climate Change Adaptation Workshop, North Pacific Landscape Conservation Cooperative Tribal Meeting, and Pacific Fifth Annual Northwest Climate Science Conference.

Outputs that we prepared include:

- Appendix I. *Agencies and resources related to climate change of potential relevance for Alaskan Tribes*: a guide to federal, state, and tribal institutions and resources related to climate change
- Appendix II. *Agency contacts*: a directory of key contact persons involved with climate change work relevant to Alaska
- Appendix III. *Report on conversations with agencies*: a summary of conversations that CRRC conducted with individuals from relevant agencies and organizations.
- Appendix IV: *Summary of climate change training/seminars/webinars attended*

Note that to respect tribes' confidentiality, detailed notes from discussions with tribes are not included as an appendix in this report. Priority issues are summarized below. Further information is available upon request.

Key findings

Key findings related to goal #1 include:

- Many agencies and organizations working at a regional level in Alaska rely on the Landscape Conservation Cooperatives (LCCs) as a primary mechanism for consulting with tribes. The LCCs, however, do not have a process for tribal networking and representation. The North Pacific LCC (NP LCC) coordinator is open to working with CRRC and others to improve this process. This could be an important step toward better engaging tribes with agencies in the process of planning, priority-setting, and activities related to climate change in Alaska. In November 2014, there will be opportunities in Alaska for CRRC and member tribes to engage with the LCCs on Climate Change issues.
- Many organizations also report that they engage Alaskan tribes in climate change work through individual connections that are based on interpersonal communications. Tribes that are proactive in reaching out to organizations on climate change are much more likely to receive support. Meanwhile, most tribes name only a few organizations as those with whom they have trusting partnerships. Most of these trusted partners are not heavily engaged in climate change work. These findings further highlight a need for mechanisms that better network and build trusting, mutually-beneficial relationships between tribes and organizations engaged in climate change work.
- Organizations that may serve as mutually-beneficial partners with CRRC and member tribes on climate change include: University of Alaska Fairbanks (UAF) Resilience and Adaptation Program (regarding a process for matching tribal concerns with university resources), UAF Tribal Management Program (regarding capacity building for climate change-related governance), and the Alaska Native Tribal Health Consortium. The National Center for Ecological Data Analysis and Synthesis (NCEAS) could be a useful partner for any initiative to address the compilation and analysis of preexisting data (such an undertaking was recommended by one of the CRRC tribes). The Alaska Center for Climate Awareness and Policy (ACCAP) will be writing their next five-year proposal to NOAA next summer. This is an ideal time to arrange partnerships that would be written in to the five year plan. Interactions with ACCAP prior to next summer, for example through a joint workshop, could help to build relationship and ideas toward tribal organizations' inclusion in the five-year plan.
- The Chugach Climate Change Vulnerability Assessment covers most of the CRRC region, and is nearing completion. This process has laid the groundwork for advancing action on climate change adaptation in the region. A leader of the vulnerability assessment (John Morton, USFWS) is interested in establishing a practitioners' group on adaptation that includes tribes. The NP LCC coordinator is open to supporting this process.

Key findings related to goal #2 include:

- Tribes expressed interest in actions with *tangible outcomes* that address priorities related to subsistence, socio-cultural health, and/or data needs. Climate change work in south-central Alaska

must ensure that vulnerability assessments are not ends to themselves. Many past plans and studies are not fully utilized.

- Although agencies speak of climate change as a stand-alone entity, it is interrelated with a range of social and environmental issues of concern at the tribal level. All tribes express concern about challenges that relate to climate vulnerability and resilience, although tribes do not always consider these issues as matters of climate change.
- One tribal planning process that intersects with climate change is work planning for the USEPA Indian Environmental General Assistance Program (IGAP). Most tribes in the Chugach region lack contemporary natural resource management plans or planning processes, and many lack natural resource officers other than the IGAP personnel. Thus IGAP provides a mechanism through which to incorporate climate change into tribal planning processes. The IGAP officers from the USEPA are open to collaborating with CRRC and tribes on strengthening the incorporation of climate change into IGAP work plans.
- Much of the data, findings, or plans resulting from past studies in the Chugach region are currently not accessible or readily usable for Chugach tribes. There is a need for tribes to be able to access and make use of the data and knowledge that exists as they seek to make informed decisions in the face of climate change.
- Governance is a key issue for Alaskan tribes in climate change work. Tribes' ability to prepare for climate change resilience is fundamentally limited by governmental authority over natural resources. Mechanisms to improve tribal participation in natural resource governance beyond the boundaries of the village corporation are essential. Such mechanisms may include management partnerships with regional corporations, improved participation in decision-making processes related to federal lands, and understanding where tribes can make progress within the regulatory system on key issues. LCCs are uniquely positioned as one mechanism to facilitate tribal engagement in governance because they engage state and federal agencies.

Key findings related to goal #3:

- Priority issues expressed by Chugach tribes include the following.

Food security / subsistence

- Preserving salmon stocks into the future
- Restoring shellfish in the face of ocean acidification

Watersheds

- Vulnerability of water supply
- Shoreline erosion
- Need for improved watershed management planning prior to additional construction

Related social issues

- Young adults leave for work outside of the village and do not return to participate in crafting the future of the village.
- Need for employment opportunities and reduced cost of living in the village

Monitoring

- Need for baseline data to understand how resources are being affected by climate change
- Desire to translate Traditional Ecological Knowledge into empirical data sets so that the information can be useful to tribal resource managers.

While these are priorities, they are not shared by every village. Climate change efforts at a regional level must be sufficiently flexible to embrace variability between villages.

- Improved mechanisms are needed for tribal consultation and representation in ongoing climate change initiatives. Steps to enhance these mechanisms will be an essential component of Phase II of the climate change adaptation planning process.
- CRRC Board members and community residents express a keen interest in climate change and a desire to continue climate change planning.

Appendix I
Agencies and resources related to climate change
of potential relevance for Alaskan Tribes
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Last updated: 10 September 2014, Brenda Gail Bergman.

Overview

This document indicates key institutions engaged in climate change work whose programs may be of interest / relevance to Alaskan native communities. It also summarizes select resources for understanding and addressing climate change impacts. Institutions that may be of primary relevance as potential partners or sources of information for CRRC are highlighted in red. A separate file summarizes climate-related funding opportunities.

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I. Institutions addressing Climate Change

1. Alaska Interagency

1.1. Alaska Climate Change Executive Round Table (ACCER). ACCER is a round-table of federal and non-federal agencies in Alaska with activities related to climate change. The scientific priorities of the Alaska CSC are driven by the needs and priorities of the natural and cultural resource management communities in the Alaska region.

<http://www.doi.gov/csc/alaska/Stakeholder-Advisory-Council.cfm>

1.2. The Climate, Ecosystems & Human Health Work Group

The primary purpose of this group is to identify and describe climate impacts that are priorities for public health. <http://www.climatechange.alaska.gov/chh.htm>

1.3. Alaska Sub-Cabinet on Climate Change. The sub-cabinet is developing recommendations on the assembly of scientific research, modeling, and mapping information regarding the actual and projected effects of climate change in Alaska. It is composed of the Commissioners (or their designees) of the Alaska Departments of Environmental Conservation (Larry Hartig); Natural Resources (Tom Irwin); Commerce, Community, and Economic Development (Emil Notti); Fish and Game (Denby Lloyd); and Transportation and Public Facilities (Leo von Scheben). Liaisons to the Sub-cabinet include the University of Alaska (Buck Sharpton), and the Governor's Office (John Katz).

<http://www.climatechange.alaska.gov/>

- Adaptation advisory group <http://www.climatechange.alaska.gov/aag/aag.htm>
- Mitigation advisory group <http://www.climatechange.alaska.gov/mit/mag.htm>
- Immediate action work group
http://www.climatechange.alaska.gov/docs/iaw_finalrpt_12mar09.pdf
- Research needs work group
http://www.climatechange.alaska.gov/docs/rn_12jun09_dfrpt.pdf

1.4. The Alaska Climate Change Coordinating Committee . The Alaska Climate Change Coordinating Committee is an interagency group comprised of ACCER member agency science officers, or their equivalent, with the purpose of providing a point of synthesis for Landscape Conservation Cooperative, Climate Science Center, Regional Climate Center, and agency priorities. Provides guidance in the conversion of stakeholder input into an **Annual Action Plan**.

2. Federal interagency

2.1. Landscape Conservation Cooperatives

The 22 Landscape Conservation Cooperatives (LCC) form a network of resource managers and scientists who share a common need for scientific information and interest in conservation. Each LCC brings together federal, state, and local governments along with Tribes and First Nations, non-

governmental organizations, universities, and interested public and private organizations. Most are initially funded under the USFWS. <http://lccnetwork.org/>

- North Pacific LCC (covers most of CRRC's area) <http://www.northpacificlcc.org/>
- Northwest Boreal LCC (includes the Western Kenai) <http://nwblcc.org/>

2.2. Cooperative Ecosystem Studies Units (CESU)

A national consortium of federal agencies, tribes, academic institutions, state and local governments, nongovernmental conservation organizations, and other partners working together to support informed public trust resource 18 Resource Guide to Federal Climate Adaptation Programs Stewardship. <http://www.cesu.psu.edu/>

Pacific Northwest CESU

http://www.cesu.psu.edu/unit_portals/PANO_portal.htm

2.3. The U.S. Global Change Research Program (USGCRP) . A federal program that coordinates and integrates research on changes in the global environment and their implications for society across 13 government agencies. All of the climate change science products completed by the 13 participating federal agencies falls under the umbrella of the USGCRP, but a few products are produced collaboratively by the program. The most important of these is the National Climate Assessment. <http://www.globalchange.gov/>

2.4. PNW Climate Change Collaboration. The Pacific Northwest Climate Change Collaboration (C3) is intended to better organize, integrate and focus the federal community's efforts to address the effects of climate change on natural resources in the Pacific Northwest region; foster collaborative efforts between research, management and regulatory agencies and programs ("knowledge-to-action"); and provide a portal to the federal climate change community in the Pacific Northwest, for states, academic organizations, tribal organizations and others. <http://www.c3.gov/>

3. Federal individual agencies

3.1. Department of the Interior (DOI). The mission of the DOI is to "protect America's natural resources and heritage, honor our cultures and tribal communities, and supply the energy to power our future." DOI has responsibility to manage one-fifth of the land in the country <http://www.doi.gov/index.cfm>

3.1.3. Bureau of Indian Affairs (BIA). The BIA has had a climate program for the past 6 years, [which includes an annual solicitation for climate change vulnerability assessments, meetings, and associated travel. In 2014, their funding also includes a category for ocean policy.](http://www.bia.gov/WhoWeAre/RegionalOffices/Pacific/NaturalResources/index.htm) <http://www.bia.gov/WhoWeAre/RegionalOffices/Pacific/NaturalResources/index.htm>

3.1.2. U.S. Geological Survey (USGS). The USGS is the main science organization of the DOI. http://www.usgs.gov/climate_landuse/

3.1.2.a. Native projects

[The USGS is working with Native American communities and organizations to understand climate change impacts to their land and neighborhoods. Projects include interviews with indigenous Alaskans to understand their personal observations of climate change.](#)

http://www.usgs.gov/blogs/features/usgs_science_pick/climate-change-impacts-to-tribal-communities/

3.1.2.b. Climate Science Centers (CSCs) and National Climate Change and Wildlife Science Center (NCCWSC). The CSCs provide climate impact science to partners, They seek to provide tools and information needed to develop and execute management strategies that address the impacts of climate change. The CSCs are managed by the National Climate Change and Wildlife Science Center (NCCWSC).

<https://nccwsc.usgs.gov/>

<http://www.doi.gov/csc/index.cfm>

- **Alaska CSC** – <http://www.doi.gov/csc/alaska/index.cfm>

3.1.2.c. Science and Decision Center (SDC). The Science and Decision Center is an interdisciplinary organization advancing the use of science in natural resource decision making. The SDC focuses on research and applications in three science areas: decision science (adaptive management and structured decision making), ecosystem services, and resilience/sustainability.

<http://www.usgs.gov/sdc/>

3.1.2.d. Land Change Science Program

The program monitors land use and land cover change at multiple scales.

http://www.usgs.gov/climate_landuse/lcs/

3.2. U.S. Fish and Wildlife Service (FWS). The FWS is the bureau within DOI with the mission of working with others to conserve, protect, and enhance fish, wildlife and plants and their habitats. The FWS climate change work includes the development of guides for planning and conservation under climate change <http://www.fws.gov/home/climatechange/>

3.3. National Park Service (NPS). The NPS' Climate Change Response Program (CCRP) is a cross-disciplinary program that provides guidance, training, technical expertise, project funding, and educational products that support NPS actions to preserve the natural and cultural resources and values of the National Park Service. <http://www.nps.gov/subjects/climatechange/index.htm>

3.4. Bureau of Land Management (BLM). BLM is the agency tasked with sustaining the health, diversity, and productivity of America's public lands for the use and enjoyment of present and future generations. The BLM administers more than 245 million surface acres of the United States. Most of this land is located in the 12 Western states, including Alaska. To address climate change, the BLM has introduced Rapid Ecoregional Assessments (REA) and a landscape approach for managing public lands. **No REA has been conducted for Southern Alaska* <http://www.blm.gov/wo/st/en/prog/more/climatechange.html>

3.5. Bureau of Reclamation (BOR). The BOR is the largest wholesaler of water in the country. Their climate change work includes discerning hydrologic projections under climate change. <http://www.usbr.gov/research/climate/>

3.6. U.S. Department of Agriculture (USDA). The USDA has responsibility for dealing with food, agriculture, natural resources, rural development, nutrition, and related issues. The department addresses climate change through its Climate Change Program Office.

<http://www.usda.gov/wps/portal/usda/usdahome?navid=climate-change>

3.6.1. USDA Climate Change Program Office. The Climate Change Program Office (CCPO) coordinates USDA's responses to climate change, focusing on implications of climate change on agriculture, forests, grazing lands, and rural communities.

http://usda.gov/oce/climate_change/

3.6.2. Regional Climate Hubs for Risk Adaptation and Mitigation to Climate Change

These seven regional hubs are not yet fully developed, but will eventually deliver science-based knowledge and practical information to farmers, ranchers, and forest landowners within each region to support decision-making in the context of climate change.

http://www.usda.gov/oce/climate_change/regional_hubs.htm

3.7. U.S. Forest Service. The Forest Service manages 193 million acres of public National Forests and Grasslands, and shares responsibility for the stewardship of roughly 500 million acres of non-federal forests with States, Tribes and private landowners. The agency's mission is implemented by three divisions: the National Forest System, State & Private Forestry, and Research & Development (R&D). R&D established a Global Change Research Program in the late 1980s.

<http://www.fs.fed.us/climatechange/advisor/>

3.7.1. Climate Change Resource Center (CCRC). The CCRC provides natural resource managers with access to science based information and tools concerning ecosystem management and climate change. <http://www.fs.fed.us/ccrc/>

3.7.2. Research Stations. Research is conducted at more than 67 Forest Service research laboratories nationally. <http://www.fs.fed.us/research/>

• **Pacific Northwest Research Station** <http://www.fs.fed.us/pnw/about/labs.shtml>

3.7.3. Western Wildland Environmental Threat Assessment Center (WWETAC)

The goal of WWETAC is to generate and integrate knowledge and information to provide credible prediction, early detection, and quantitative assessment of environmental threats in the western United States. <http://www.fs.fed.us/wwetac/>

3.7.4. Northern Institute of Applied Climate Science (NIACS). A collaborative effort among the Forest Service, universities, and forest industry to provide information on managing forests for climate change adaptation, enhanced carbon sequestration, and sustainable production of bioenergy and materials. <http://www.nrs.fs.fed.us/niacs/>

3.8. U.S. Department of Commerce – National Oceanic and Atmospheric Administration (NOAA).

The U.S. Department of Commerce (DOC) is the federal department concerned with promoting economic growth. The National Oceanic and Atmospheric Administration (NOAA) is the agency within DOC with responsibility for natural resources. NOAA's climate adaptation resources fall under the Climate Program Office and the National Ocean Service.

<http://www.noaa.gov/climate.html>

3.8.1. NOAA Climate Program Office (CPO)

The Climate Program Office manages competitive research programs in which NOAA funds high-priority climate science, assessments, decision support research, outreach, education, and capacity-building activities. <http://cpo.noaa.gov/>

- **NOAA Climate Service for Alaska** (proposed) will provide climate products (both existing and new) and place-based information and assessments in support of decision-making.

3.8.2. Regional Integrated Sciences and Assessments (RISA). The RISA program supports research teams with the mission of expanding and building the nation's capacity to prepare for and adapt to climate variability and change. The emphasis is on producing science to support policy decisions. <http://cpo.noaa.gov/ClimatePrograms/ClimateandSocietalInteractions/RISAProgram.aspx>

Alaska Center for Climate Assessment and Policy (ACCAP). One of 11 RISA projects across the United States. <http://cpo.noaa.gov/ClimatePrograms/ClimateandSocietalInteractions/RISAProgram/RISATeams/ACCAP.aspx>

3.8.3. National Ocean Service. The mission of the National Ocean Service (NOS) is to provide science-based solutions through collaborative partnerships <http://oceanservice.noaa.gov/>

3.8.4. Office of Ocean and Coastal Resource Management (OCRM). Provides national leadership to state and territory coastal programs and estuarine research reserves to keep America's coasts healthy and resilient. <http://coastalmanagement.noaa.gov/climate.html>

3.8.5. Coastal Services Center. The NOAA Coastal Services Center works to protect coastal resources and keep communities safe from coastal hazards by providing data, tools, training, and technical assistance. <http://www.csc.noaa.gov/>

3.9. U.S. Environmental Protection Agency (EPA). The EPA focuses on collecting data on emissions and developing policy to reduce those emissions. EPA collects various types of greenhouse gas emissions data. <http://www.epa.gov/climatechange/>

3.9.1. Healthy Watershed Initiative. The Healthy Watersheds Initiative includes both assessment and management approaches that encourage entities to take a strategic, systems approach to conserve healthy components of watersheds. <http://water.epa.gov/polwaste/nps/watershed/index.cfm>

3.9.2. Climate Ready Estuaries Program. The Climate Ready Estuaries program works with the National Estuary Programs and the coastal management community to assess climate change vulnerabilities, to develop and implement adaptation strategies, and to engage and educate stakeholders. <http://water.epa.gov/type/oceb/cre/index.cfm>

4. International

4.1. Intergovernmental Panel on Climate Change (IPCC). The IPCC is a scientific body under the auspices of the United Nations (UN). It reviews and assesses the most recent scientific, technical

and socio-economic information produced worldwide relevant to the understanding of climate change. <http://www.ipcc.ch/>

5. University Climate Change centers / programs

- **University of Alaska Fairbanks, Community Partnership for Self Reliance and Sustainability.** A program that seeks to match needs identified by tribes / communities with technical expertise or resources at UAF. Under the Resilience and Adaptation Program <http://www.uaf.edu/rap/>
- **Alaska Center for Climate Assessment and Policy (ACCAP).** (noted above under USGS – this is a partnership with University of Alaska Fairbanks and the USGS) <http://cpo.noaa.gov/ClimatePrograms/ClimateandSocietalInteractions/RISAProgram/RISATeams/ACCAP.aspx>
- **University of Alaska Fairbanks, Scenarios Network for Alaska and Arctic Planning (SNAP).** The SNAP program tries to make science available and relevant to stakeholders in the state. SNAP has done a lot of work at downscaling climate models to local scale. Tools are available on their website, including lots of raw data that's used by the research community. <http://www.snap.uaf.edu/>
- **University of Alaska Fairbanks, Tribal Management Program.** The program seeks to strengthen tribal governance. Strengthening governance over natural resources is a critical component of any meaningful climate change resilience and adaptation initiative, particularly with respect to Alaskan tribes. <http://uaf.edu/iac/programs/tribal-management/>
- **Alaska Climate Change Research Center.** The Alaska Climate Research Center is a research and service organization at the Geophysical Institute, University of Alaska Fairbanks. They conduct research focusing on Alaska and Polar Regions climatology and archive climatological data for Alaska. <http://climate.gi.alaska.edu/ClimTrends/Change/TempChange.html>
- **North American Regional Climate Change Assessment Program** . Offers data for researchers. PENDING: Vulnerability Database- Pending- USGS cooperative effort to list all the vulnerability assessments with search fields (in initial planning stages 3-2013) <http://www.narccap.ucar.edu>
- **Pacific Institute for Climate Solutions.** The Pacific Institute for Climate Solutions is a dynamic knowledge network that brings together leading researchers from British Columbia and around the world to study the impacts of climate change and to develop positive approaches to mitigation and adaptation. <http://pics.uvic.ca/>
- **Cornell University.** Cornell conducts a lot of research in climate change and provides outreach programs. <http://climatechange.cornell.edu/research/>
- **Climate Impact Group.** The Climate Impacts Group (CIG) at University of WA is an internationally recognized interdisciplinary research group studying the impacts of natural climate variability and global climate change ("global warming"). Most work is focused on the Pacific Northwest (PNW). <http://climatechange.cornell.edu/research/>

Through research and interaction with stakeholders, the CIG works to increase community and ecosystem resilience to fluctuations in climate. <http://cses.washington.edu/cig/>

- **University of Oregon Environmental and Natural Resources Law Program.** The Climate Change Initiative (CCI) is the Environmental and Natural Resources Law Program’s response to the current climate crisis, hosted and driven by the fellows of the Global Environmental Democracy Project. The goal of CCI is to inform, educate and connect law students, practitioners, and policymakers to emerging developments in climate law and policy. <http://enr.uoregon.edu/>
- **The Center for Climatic Research.** They assess past and future climate change worldwide, including impacts on Arctic sea ice and clouds, the hydrologic cycle, atmospheric and oceanic circulation patterns, and weather extremes. <http://ccr.aos.wisc.edu/>

II. Climate Change Resources

1. Resources for tribes

- **Alaska Native Knowledge Network.** The Alaska Native Knowledge Network (ANKN) is designed to serve as a resource for compiling and exchanging information related to Alaska Native knowledge systems and ways of knowing. It has been established to assist Native people, government agencies, educators and the general public in gaining access to the knowledge base that Alaska Natives have acquired through cumulative experience over millennia. <http://www.ankn.uaf.edu/>
- **Alaska Native Science Commission.** The commission seeks to address climate change as a “key issue”. <http://www.nativescience.org/issues/climatechange.htm>
- **Environmental Protection Agency’s Tribal Air Quality Program.** Indian tribes have express authority under the Clean Air Act and the Tribal Authority Rule to manage air quality in Indian country. The EPA provides technical assistance and resource to help Tribes built their program capacity. Promoting Generations of Self-Reliance – Stories and Examples of Tribal Adaptation to Change. <http://yosemite.epa.gov/R10/tribal.nsf/programs/tribalair>
- **Intertribal Climate Change Working Group.** The *Native Communities and Climate Change* project seeks to provide resources for climate change adaptation and natural resource planning by American Indian tribes as well as to provide useful information to organizations and agencies working with Indian tribes on these issues. <http://www.tribesandclimatechange.org/>
- **Native Climate.** They are currently preparing an on-line database with over thousands of entries and links to policy, scientific and tribal documents and organizations related to indigenous peoples and climate change, and has documented over 4,000 different adaptation measures, many specific to indigenous peoples. native.climatecommons.net
- **Native American Fish & Wildlife Society (NAFWS) – Climate Change news**
<http://www.nafws.org/climate-change/ccnews>

- **Affiliated Tribes of Northwest Indians** - Represents 57 Northwest tribal governments from Oregon, Washington, Idaho, Northern California, Southeast Alaska, and Western Montana. ATNI is engaging in climate change work, although it is not currently one of their focal areas.
<http://www.atnitribes.org/about-atni>
- **Institute for Tribal Environmental Professionals (ITEP)** . ITEP's website offers information and resources tailored to tribes who seek a better understanding of climate change and its impacts to tribal communities. <http://www4.nau.edu/tribalclimatechange/index.asp>
 - **Tribes & Climate Change website.** This website developed by the Institute for Tribal Environmental Professionals (ITEP) includes profiles of tribes being impacted by climate change and how they are addressing those impacts, audio recordings of tribal elders offering their views on climate change, general information about climate change and its impacts, and links to numerous online resources, announcements about upcoming events, and funding opportunities. <http://www4.nau.edu/tribalclimatechange/index.asp>
 - **Tribal Climate Change Newsletter.** This newsletter provided by the Institute for Tribal Environmental Professionals (ITEP) includes updates on ITEP's Climate Change Program; news items about tribes and climate change; useful resources; announcements about funding opportunities and upcoming events; and other information relevant to tribes and climate change issues. The newsletter is delivered monthly by email. Contact Sue Wotkyns to be added to the distribution list: susan.wotkyns@nau.edu.

2. Key resources for educators

- **Camel Climate Change Education.** Camel Climate Change Education provides free multimedia resources educators on climate change causes, consequences, solutions and actions. The educator is able to create courses, textbooks, administer exams & surveys, invite others and collaborate around teaching materials, strategies and assessment. <http://www.camelclimatechange.org/>
- **Climate Change, Wildlife, and Wildlands Toolkit.** This tool kit is designed for classroom teachers and informal educators <http://www.globalchange.gov/resources/educators/toolkit/materials>

3. Adaptation Resources

- **Alaska Department of Fish and Game Climate Change Strategy**
<http://www.adfg.alaska.gov/static/lands/ecosystems/pdfs/climatechangestrategy.pdf>
- **National Fish, Wildlife, and Plants Climate Adaptation Strategy (with NOAA and AFWA)**
FWS, NOAA, and the NY Division of Fish, Wildlife, & Marine Resources (representing state fish and wildlife agencies more broadly) co-led development of the National Fish, Wildlife, and Plants Climate Adaptation Strategy. <http://www.wildlifeadaptationstrategy.gov/index.php>
- **Coastal Climate Adaptation Website (NOAA).** The Coastal Climate Adaptation website provides a compiled list of completed adaptation plans at various levels of government, case studies of coastal adaptation, a page with resources to help with climate change communication, tools and examples for vulnerability assessments, and many other user created resources. There is also a calendar on

which you can see and post upcoming climate-related events (i.e. webinars and meetings).
<http://collaborate.csc.noaa.gov/climateadaptation/default.aspx>

- **National Action Plan: Priorities for Managing Freshwater Resources in a Changing Climate**
This National Action Plan was released through the President's Interagency Climate Change Adaptation Task Force. It provides an overview of the challenges that a changing climate presents for the management of the nation's water resources and recommends actions for federal agencies to support water resource managers in understanding and reducing the risks of climate change.
http://www.whitehouse.gov/sites/default/files/microsites/ceq/2011_national_action_plan.pdf
- **Guidebook for developing adaptation options** (USFS) <http://www.treeseearch.fs.fed.us/pubs/39884>
- **Adapting to Climate Change: A Planning Guide for State Coastal Managers (NOAA)**
<http://coastalmanagement.noaa.gov/climate/adaptation.html>
- **EcoAdapt.** EcoAdapt brings together diverse players in the conservation, policy, science, and development communities to reshape conservation and resource management in response to rapid climate change. <http://www.ecoadapt.org/>
- **Climate Adaptation Knowledge Exchange.** This website aims to build a shared knowledge base for managing natural and built systems in the face of rapid climate change. This website has four interlinked components: Case Studies, Virtual Library, Directory and Tools. It also has community forums for discussion on current issues in climate adaptation. <http://www.cakex.org/>
- **One page outline of the Adaptation Planning process** (NOAA)
<http://coastalmanagement.noaa.gov/climate/docs/planningprocess.pdf>
- **Tribal Climate Change Adaptation Plan Template** . The Institute for Tribal Environmental Professionals, developed the Tribal Climate Change Adaptation Plan Template to be a resource for tribes as they write climate change adaptation plans.. www4.nau.edu/itep/index.asp
- **The Ecosystem-Based Management (EBM) Tools Network.** They provide information about coastal and marine planning and management tools, including tools related to coastal climate change adaptation. <http://www.ebmtools.org/>
- **Adapting to Climate Change: A Planning Guide for State Coastal Managers.** This guidebook was developed to help US state coastal managers develop and implement adaptation plans to reduce the risks associated with climate change impacts affecting their coasts. Tribes located along coasts may find the guide useful. NOAA Office of Ocean and Coastal Resource Management, 2010.
<http://coastalmanagement.noaa.gov/climate/adaptation.html>
- **Technologies for Climate Change Adaptation - Water Sector** . This guidebook describes adaptation strategies in the categories of water conservation; storm water control and capture; resilience to water quality degradation; preparation for extreme weather events; diversification of water supply; and mitigation. www.waterinstitute.unc.edu/unep-project

- **Climate Project Screening Tool.** An Aid for Climate Change Adaptation, USFS Publication: Research Paper PSW-RP-263 February 2012 <http://www.treeseearch.fs.fed.us/pubs/40319>

4. Models of future environmental conditions

- **USDA Forest Service Climate Projections FAQ (USFS).** This FAQ serves as a plain-language introduction to the concepts embedded in downscaled climate projections. http://www.fs.fed.us/rm/pubs/rmrs_gtr277.pdf
- **ClimateWNA .** ClimateWNA extracts and downscales PRISM monthly data and calculates seasonal and annual climate variables for specific locations based on latitude, longitude and elevation (optional) for western North America. This program also downscales and integrates historical (1901-2011) and future climate data (2020s, 2050s and 2080s) generated by various global circulation models. <http://cfcg.forestry.ubc.ca/>
- **NEX-DCP30 (USGS).** Provides maps and summaries of historical and projected temperature and precipitation changes for the 21st century for the continental United States. The data is downscaled to the county level http://www.usgs.gov/climate_landuse/clu_rd/apps/nex-dcp30_viewer.asp
- **Geo Data Portal (USGS).** This data portal offers downscaled climate projections and other data resources. <http://cida.usgs.gov/climate/gdp/>
- **Derived Downscaled Climate Projection Portal (USGS).** This web portal allows for visualization and downloading of future climate projections from a group of statistically downscaled global climate models (GCMs), using multiple emissions scenarios, over three different time periods in the future. <http://cida.usgs.gov/climate/derivative/>
- **Sea Level Affecting Marshes Model (NOAA).** The Sea Level Affecting Marshes Model (SLAMM) simulates the dominant processes involved in wetland conversions and shoreline modifications during long term sea level rise. <http://www.csc.noaa.gov/digitalcoast/tools/slamm>
- **CLIMATEWIZZARD.** Temperature and precipitation model projections for all lower 48 (user ability to choose location and model, or average of all models). <http://www.climatewizard.org>
- **Statistical DownScaling Model (SDSM).** SDSM is a software package designed to implement statistical downscaling methods to produce high-resolution monthly climate information from coarse-resolution climate model (GCM) data. <http://www.sdsim.org.uk/>
- **Downscaled CMIP3 and CMIP5 Climate and Hydrology Projections (BOR)**
This archive contains fine spatial resolution (12km²) downscaled climate projects over the contiguous United States with monthly projections of hydrology over the Western United States. <http://www.usbr.gov/climate/> http://gdo-dcp.ucllnl.org/downscaled_cmip_projections/

5. Resources regarding climate impacts and vulnerability


5.1. Tools for assessing or addressing impacts

- **Climate Witness Community Toolkit.** The toolkit helps to document local impacts of climate change and to devise appropriate adaptation measures that local communities can implement themselves. It includes a series of activities to engage the community in identifying climate change impacts, concerns and opportunities, community values, adaptation options and a community action plan. The activities in the guidebook could be adapted to be used by tribal communities in the US. wwf.panda.org/about_our_earth/all_publications/?uNewsID=162722
- **The Climate Change Response Framework (USFS).** A collaborative, cross-boundary approach among scientists, managers, and landowners to incorporate climate change considerations into natural resource management. It provides an integrated set of tools, partnerships, and actions to support climate-informed conservation and forest management. <http://www.climateframework.org/>
- **System for Assessing Vulnerability of Species (USFS).** The Forest Service's System for Assessing Vulnerability of Species uses an online questionnaire with 22 criteria to predict the vulnerability or population response of species to provide a framework for assessing vulnerability to future climate change. <http://www.fs.fed.us/rm/grassland-shrubland-desert/products/species-vulnerability/>

5.2. Information about current and projected impacts / decision support

- **Regional Climate Change Talking Points (NPS).** These regional talking points are a series of bio-regional summaries that provide key scientific findings about climate change and impacts to protected areas.
 - **Alaska Boreal and Arctic**
<http://www.nps.gov/subjects/climatechange/upload/BorealarcticTalkingPoints.pdf>
 - **Alaska Maritime and Transitional**
<http://www.nps.gov/subjects/climatechange/upload/MaritimeTransitionalTalkingPoints.pdf>
- **Pacific Climate Impacts Consortium.** The Pacific Climate Impacts Consortium (PCIC) is a regional climate service center at the University of Victoria that provides practical information on the physical impacts of climate variability and change in the Pacific and Yukon Region of Canada. <http://www.pacificclimate.org/>
- **The National Climate Assessment (NCA).** The NCA is a status report about climate change science and climate change impacts. The report is delivered to the President, the Congress, and the public every four years. The next NCA is scheduled to be completed in early 2014. <http://ncadac.globalchange.gov/>
<http://www.globalchange.gov/what-we-do/assessment/nca-activities/available-technical-inputs>
<http://scenarios.globalchange.gov/regions>

- **Sea Level Rise and Coastal Impacts Viewer (NOAA).** The purpose of this data viewer is to provide coastal managers and scientists with a preliminary look at sea level rise and coastal flooding impacts. <http://www.csc.noaa.gov/slr/viewer/#>
- **Rapid Ecoregional Assessments (BLM).** The Rapid Ecoregional Assessments examine ecological values, conditions, and trends within eco-regions, which are large, connected areas that have similar environmental characteristics. http://www.blm.gov/wo/st/en/prog/more/Landscape_Approach/reas.html
- **Regional Vulnerability Assessments (EPA).** The Regional Vulnerability Assessment (ReVA) program conducted research on approaches to the evaluation and integration of large and complex datasets and models to assess current conditions and likely outcomes of environmental decisions, including alternative futures. <http://www.epa.gov/rev/>
- **Template for Assessing Climate Change Impacts and Management Options (USFS)**
TACCIMO is a web-based tool that connects natural resource planning to current climate change science literature. It accesses the most current climate change projections and science including the likely range of projected future climate for any state, county, or National Forest. <http://www.forestthreats.org/research/tools/taccimo>
- **Research Round-Up (USFS).** This website offers summaries of scientific research and collaborations on climate change questions being addressed. <http://www.fs.fed.us/ccrc/roundup/index.php?org=>
- **Climate change, forests, fire, water, and fish: Building resilient landscapes, streams, and managers (USFS)** This report describes the framework of how fire and climate change work together to affect forest and fish communities.
- **Climate Change Bird Atlas and Tree Atlas (USFS).** The Climate Change Atlases can help to answer a range of questions concerning current and projected suitable habitat to the year 2100 for 134 tree species and 150 bird species in the eastern United States. The Atlases also output maps and summary data that show how each species' suitable habitat is projected to change under three different climate models. <http://www.nrs.fs.fed.us/atlas/>
- **Aquatics & Fisheries Tools (USFS).** The USDA Forest Service has developed many resources for aquatic and fishery conservation. This website provides links for ongoing research projects looking at the impact of climate change and increasing stream temperatures on fish populations. <http://www.fs.fed.us/research/wildlife-fish/themes/aquatic.php>
- **Climate.gov (NOAA)** Provides science and information for a general audience. The goal is to provide information that can help people make decisions on how to manage climate-related risks and opportunities. <http://www.climate.gov/>
- **Costal Change Hazards Portal (USGS).** This tool gives you access to exploring coastal hazard risks information along America's coasts at varied scales, from local areas of interest to national scope.. Pick your favorite coastal location, type in the name, zoom in, and explore historic shorelines, rates of shoreline change, sea-level rise, forecasts related to long-term change, the Coastal Vulnerability Index and more. <http://marine.usgs.gov/coastalchangehazardsportal/>

- **National Water Program Strategy: Response to Climate Change (EPA Office of Water)**
This strategy provides an overview of the likely effects of climate change on water resources.
<http://www.epa.gov/water/climatechange/strategy.html>
- **National Snow and Ice Data Center.** This website has scientific data on snow, ice and glaciers and how global warming is affecting them. <http://nsidc.org/>
- **Ecosystem Functioning and Services (USGS – Land Change Science Program).** A decision support tool that uses land-use change scenarios and a suite of spatially-explicit models to explore the implications of future regional growth and development to various ecosystems through 2060.
http://www.usgs.gov/climate_landuse/lcs/rt_ecosys.asp
- **Using Scenarios to Explore Climate Change: A Handbook for Practitioners (NPS)**
Describes the five-step process for developing multivariate climate change scenarios taught by the Global Business Network (GBN) during a series of training workshops hosted by the National Park Service in 2010 and 2011.
<http://climate.calcommons.org/bib/using-scenarios-explore-climate-change-handbook-practitioners>
- **List of climate change related tools (USFS)** <http://www.fs.fed.us/ccrc/tools/> 
- **NetMap.** A decision support tool for rapidly conducting cost-effective watershed analysis.
<http://www.terrainworks.com/>
- **NorWest (USFS)** The tool offers decades of stream temperature monitoring data collected by more than 60 state, federal, tribal, and private resource agencies. The goal of this tool is to facilitate better climate vulnerability assessments, enable coordinated management responses, and improve the efficiency by reducing redundancies.
<http://www.fs.fed.us/rm/boise/AWAE/projects/NorWeST.html>
- **National Land Cover Database (USGS – Land Change Science Program)**
Serves as the definitive Landsat-based, 30-meter resolution, land cover database for the United States. http://www.usgs.gov/climate_landuse/lcs/rt_lcma.asp
- **National Assessment of Ecosystem Carbon Sequestration and Greenhouse Gas Fluxes (LandCarbon) (USGS – Land Change Science Program).** Aims to improve understanding of carbon sequestration and greenhouse gas fluxes in and out of ecosystems related to land use. The assessment covers all major terrestrial and aquatic ecosystems, is conducted for all fifty states, provides estimates of baseline as well as future potential carbon storage and greenhouse gas fluxes.
http://www.usgs.gov/climate_landuse/land_carbon/
- **GIS Decision Support Tools (USGS).** Offers a variety of web-based analysis and decision support tools, such as the USGS Flood Inundation Mapper.
http://www.usgs.gov/climate_landuse/lcs/projects/web_gis.asp 13 Resource Guide to Federal Climate Adaptation Programs
- **Open-Source Nonpoint Source Pollution and Erosion Comparison Tool.**

This is a GIS tool that helps users to identify land areas that generate high sediment and nonpoint source pollutant loads, and provides a means to analyze "what if" land use change scenarios that may be useful in projecting success of various planned adaptation strategies.

<http://www.csc.noaa.gov/digitalcoast/tools/openspect>

6. Health Resources

- **Alaska Native Tribal Health Consortium, Center for Climate and Health.** The consortium conducts climate-related health impact assessments, and coordinates the LEO network to document unusual plants and wildlife, extreme weather, erosion, flooding, droughts, wildfire and other events that can threaten food security, water security and community health
<http://www.anthc.org/chs/ces/climate/>
- **Climate Information for Public Health Action Network .** THE CIPHAN has been developed to provide public health professionals with knowledge, methodologies, tools, and data to better manage climate sensitive diseases. It acts as a web portal to guide the learner towards other sources of information, as well as a source of learning resources, such as educational modules and exercises.
<http://ciphan.iri.columbia.edu/>

7. Webinars (select)

7.1. General climate change

- **2014 Climate Change Impacts and Indian Country Webinar Series.** This webinar series has many topics, which includes: Human Health and Community Development, Natural Resources and Agriculture, Built systems: Transportation, Water, Energy, and Other Infrastructure and Disaster Recovery and Resilience.
<http://ww2.wapa.gov/sites/western/renewables/Pages/Webcasts.aspx#climatechange>
- **Tribes and the National Climate Assessment.** This webinar has an overview of change impacts on tribes and current adaptation and mitigation efforts.. <http://youtu.be/vphSIVth0do>
- **ArcSEES--Arctic Science, Engineering, and Education for Sustainability.** This webinar is about ArcSEES. ArcSEES is an interagency, international, and interdisciplinary program designed to stimulate research and capacity building focused on the sustainability of the Arctic human-environmental-built system.
http://www4.nau.edu/itep/climatechange/docs/webnr_0612ArcSEESPresr.pdf
- **ITEP's Climate Change Trainings and Resources for Tribes.** This Presentation is about The Institute for Tribal Environmental Professionals at Northern Arizona University who provide tribes throughout the U.S. with training and assistance to build their capacity to manage their environmental resources. http://www4.nau.edu/itep/climatechange/docs/webnr_ITEP_AKTCC.pdf
- **Tribal Climate Change Funding Guide.** This presentation is about impacts from climate change, such as ocean acidification, sea level rise and species migration, may disproportionately affect American

Indian and Alaska Native tribal culture and subsistence practice. The Tribal Climate Change Funding Guide describes funding resources that are directly related to climate change or can be used indirectly for adaptation efforts.

http://www4.nau.edu/itep/climatechange/docs/webnr_1112TCCP.pdf

- **Sustainable Energy Opportunities: Best Practices for Alaska Tribes.** This presentation provides an overview of a renewable energy development resource guide for rural Alaska tribal communities. http://www4.nau.edu/itep/climatechange/docs/webnr_031213SustEnrgyOpp.pdf
- **Climate Change Outreach and Education.** This presentation provides information about outreach and education material and resources that tribes can use in engaging their tribal community about climate change. http://www4.nau.edu/itep/climatechange/docs/webnr_CCOutrChEd.ppt
- **Climate Change Impacts on Tribes.** This presentation provides an overview of climate change impacts and vulnerabilities of tribes in the United States. It draws on the findings from the draft 2013 National Climate Assessment's (NCA) chapter on tribes, Impacts of Climate Change on Tribal, Indigenous, and Native Lands and Resources. http://www4.nau.edu/itep/climatechange/docs/webnr_CCImpacts.pdf
- **Indicators of Climate Change.** This presentation provides an overview of U.S. Environmental Protection Agency's Climate Change Indicators in the United States, 2012 report, which presents a set of 26 indicators tracking observed signs of climate change in the United States. http://www4.nau.edu/itep/climatechange/docs/webnr_CCIndicators.pdf
- **Climate Change-What it is and why it's important.** This presentation reviews climate change terminology, the basics of climate change, and why climate change is an important issue for everyone http://www4.nau.edu/itep/climatechange/docs/webnr_CCBasics.pdf
- **Adapting Region 10 Programs to Climate Change: How we are implementing the science and Executive orders.** This presentation discusses the President's Climate Action Plan, the findings from the recent Intergovernmental Panel on Climate Change report and its relevancy to Alaska, EPA activities in Alaska related to climate change, and discusses how to better engage with tribes. http://www4.nau.edu/itep/climatechange/docs/webnr_CCPresentationAlaska_110613.pdf
- **Climate Change Impacts to First Foods.** Presented by Cheryl Shippentower, Confederated Tribes of the Umatilla Indian Reservation. http://www4.nau.edu/itep/climatechange/docs/webnr_CTUIRFirstFoodsMgmt.pdf
- **Alaska Tribal Climate Change Webinar.** John Mankowski, Coordinator of the North Pacific Landscape Conservation Cooperative, provides an overview of the LCCs and how tribes can be involved in these partnerships. http://www4.nau.edu/itep/climatechange/docs/webnr_JMankowski_NPLCC.pdf

- **Communicating about Climate Change – From Impacts to Solutions.** This presentation is on [effectively engaging the public as partners in addressing the challenge requires emphasizing local, current and personally relevant impacts and bridging to solutions. http://youtu.be/0Ao99Rm6dDk](http://youtu.be/0Ao99Rm6dDk)
- **The Role of Traditional Knowledge in Climate Change Initiatives.** This webinar explores the ways in [which indigenous traditional knowledge may inform understanding how climate change is impacting indigenous cultural resources and life ways, and help lead to culturally-relevant adaptation strategies. http://www4.nau.edu/itep/climatechange/webinars/TCC_WebinarRoleofTK-061614.wmv](http://www4.nau.edu/itep/climatechange/webinars/TCC_WebinarRoleofTK-061614.wmv)

7.2. Climate Change Impacts on Natural Resources

- **Using soils to predict forest cover responses to climate change in the NPLCC.** This webinar shows how soil maps can be used to identify matching patterns in soil characteristics, water availability and tree mortality. <http://www.northpacificlcc.org/using-soils-to-predict-forest-cover-responses-to-climate-change-in-the-nplcc>
- **How will climate change affect bird distribution and abundance in the North Pacific?** They will provide examples of how bird species distribution and abundance models representing current and future climate conditions within the southern portion of the North Pacific LCC, coupled with a coniferous forest bird conservation plan for this area, can be used to inform natural resource management planning efforts. <http://www.northpacificlcc.org/how-will-climate-change-affect-bird-distribution-and-abundance-in-the-north-pacific>
- **Climate Change Effects on Pacific Northwest Ecosystems.** <http://www.northpacificlcc.org/climate-change-effects-on-pacific-northwest-ecosystems>
- **Climate Change Impacts on Forests.** This webinar provides highlights of current science about climate change impacts on forests in the Pacific Northwest, and includes a discussion of the implications of these impacts for tribes. <http://youtu.be/bNrezfLVrGY>
- **Climate Change and Marine Issues.** This webinar provides highlights of current science about climate change and sea level rise, ocean acidification, and effects of rising water temperature on disease processes, and a discussion of the implications of these impacts for tribes. <http://youtu.be/GQzOEMRRnEs>
- **Climate Change Impacts on Fisheries.** This webinar will provide highlights of current science about climate change impacts on fisheries in the Pacific Northwest, and a discussion of the implications of these impacts for tribes. <http://youtu.be/gmjtvAUdnw4>
- **Climate Change and Invasive Species and Pests.** This webinar will provide highlights of current science about climate change and invasive species and pests in forest ecosystems and in freshwater ecosystems in the Pacific. <http://youtu.be/YCgplyZbQdU>

- **Waste Erosion Assessment and Review (WEAR) Project.** This presentation is about coastal and river erosion has the potential to cause hazardous substances and garbage from Alaska's eroding landfills, closed dump sites, and contaminated sites to be released into the ocean and the state's rivers, jeopardizing Alaska's waters, fish and wildlife.
http://www4.nau.edu/itep/climatechange/docs/webnr_0612WEARPres.pdf
- **Climate Change Impacts on Tribal Water Resources.** This talk provides an overview of climate change impacts on tribal water resources and the subsequent cascading effects on the livelihoods and cultures of American Indians and Alaska Natives.
http://www4.nau.edu/itep/climatechange/webinars/TCC_WebinarTribalWaterResSW-060914.wmv
- **Climate Change Impacts on Traditional Foods.** During this webinar, presenters will discuss climate impacts on traditional foods as well as adaptation techniques that have been adopted.
http://www4.nau.edu/itep/climatechange/webinars/TCC_WebinarTradiFoods-060514.wmv

Appendix II: Agency contacts for CRCC's Climate Change Adaptation Planning

Last updated: 11 September 2014 by Brenda Gail Bergman

Institution	Name, Position	Last contact	Phone	Email	Location	Website	Notes
In BIA CC Adaptation Planning grant proposal							
USFWS, Kenai National Wildlife Refuge	John Morton, Biologist (working on Chugach forest vulnerability assessment)	Brenda spoke with on 22 August, meeting with Jeff and Brenda on 11 September 2014	907-260-2815	john_m_morton@fws.gov			
EPA, Region 10	Mike Cox, Climate Change Coordinator	Brenda spoke with Michael on 2 September.	206 553 1597	Cox.Michael@epamail.epa.gov	Seattle		
EPA, Alaska Operations Office	Michelle Davis, Tribal Coordinator (one of several)	Brenda spoke with Michelle on 2 September.	271 3434	davis.michellev@epa.gov	Anchorage		
EPA, Alaska Operations Office	Santina Gay	Brenda spoke with Santina on 2 September.	(907) 271-3413	baumeister.santina@epamail.epa.gov	Anchorage		
EPA, Alaska Operations Office	Martha Barber, Grants Coordinator	Brenda sent email 1 August. Spoke with Martha on 19 August. She said that Michelle Davis would be the person to speak with about climate programs and about grants. Brenda spoke with Michelle (see below).	271-5079	Barber.Martha@epamail.epa.gov		http://yosemite.epa.gov/r10/homepage.nsf/vwOfficeList/Staff+and+Phone+Listing	Funding sources: GAP & Direct Implementation agreements http://www.epa.gov/tribalportal/GAP-guidance-final.pdf http://www.epa.gov/tribalportal/aieo/index

							.htm
Institution	Name, Position	Last contact	Phone	Email	Location	Website	Notes
USDA Forest Service - Chugach National Forest, Vulnerability Assessment Work Center	Greg Hayward, Wildlife ecologist	Brenda sent email 1 August. Spoke with on 22 August 2014.	(907) 743-9537	ghaywvd@fs.fed.us	Anchorage	http://www.fs.fed.us/wildecology/staff/ghayward.html	
USGS, Alaska Climate Science Center	Steve Gray, Director. Point of contact for roundtable	Brenda spoke with Steve on 27August.	786-6780	sgray@usgs.gov	Anchorage, AK		https://csc.alaska.edu/resource/alaska-climate-change-executive-roundtable
University of Alaska Fairbanks.	Kevin Illingworth, Tribal management program head, Interior-Aieutians Campus Carry Stevens Byron Bluehorse	Brenda spoke with Kevin, Carry and Byron <i>on Tuesday August 26th</i>	907-474-5710	<u>kevin.i@alaska.edu</u> cmstevens@alaska.edu			Involved in a Alaska and Hawaii native serving competitive grants
USFWS	Charla Sterne, Alaska Region Climate Change Coordinator	Brenda sent email 1 August. Out of office response, no return date. Brenda called and left voice message on 19 August.	907-786-3471	Charla_Sterne@fws.gov	Anchorage	http://www.fws.gov/alaska/sa/contact.htm	Coordinator of Alaska CC Executive Round Table https://csc.alaska.edu/sites/default/files/ACCER_Document.pdf
USFS Chugach Tribal Liaison Anthropologist,	Ed Declava	<i>Ed's email bounced on 1 August. Brenda left voice message on 19 August.</i>	907-743-9522	edecalva@fs.fed.us			<i>Ed's email bounced on 1 August. His contact info online is not</i>

Heritage Program							<i>associated with the position listed in the proposal.</i>
Institution	Name, Position	Last contact	Phone	Email	Location	Website	Notes
BIA	Mark Kahklen, NEPA Coordinator	Brenda wrote on 25 August, no response.	907-271-4004	Mark_Kahklen@bia.gov			
Additional - Not in BIA Adaptation Planning grant proposal							
Alaska native tribal health consortium, Climate Impact Assessments	Michael Brubaker	Brenda spoke with on 19 August	907-729-2464	mbrubaker@anthc.org			They have network of people with stories. Michael is excited about collaboration.
North Pacific Landscape Conservation Cooperative (includes SE Alaska)	John Mankowski; Coordinator	Brenda spoke on 20 August, met with on September 4th	360.534.9330 360-791-7040	john_mankowski@fws.gov	Lacey, WA	http://www.northpacificlcc.org/	
DOI Alaska Climate Science Center	Dr. T. Scott Rupp, Director, Scenarios Network for Alaska & Arctic Planning (SNAP); University Director, DOI Alaska Climate Science Center Professor, International Arctic	Brenda spoke with on August 27th	907-474-7535	tsrupp@alaska.edu	Anchorage, AK		

	Research Center						
NOAA RISA, Alaska Center for Climate Assessment and Policy	<p>Sarah Trainor; Principal Investigator, University of Alaska Fairbanks</p> <p>Tina Buxbaum “Sarah is currently on maternity leave, but I am happy to speak with you. I am the ACCAP program manager and a good general point of contact for ACCAP.”</p>	Brenda spoke with Tina on 29 August. Sarah has been out on maternity leave.	<p>(907) 474-7878 (Sarah)</p> <p>(907) 474-7812 (General)</p>	<p>sarah.trainor@alaska.edu</p> <p>accap@uaa.f.edu</p> <p>tmbuxbaum@alaska.edu</p>	Fairbanks, AK	https://accap.uaf.edu/?q=explore&f[0]=field_content_category%3A46	
Gulf Watch Alaska (NCEAS Exxon project)	<p>Matt Jones, director</p> <p>Mark Schildhauer</p>	Brenda wrote 7 August. Met with Mark Schildhauer on 14 August		jones@nceas.ucsb.edu		Based in Juneau	
University of Alaska Fairbanks, Community Partnership for Resilience and Adaptation	Terry Chapin	Brenda met on 13 August		Terry.chapin@alaska.edu			
BIA, Northwest Region	Keith Hatch	Brenda spoke with on 4 September					
University of Oregon climate change reporting project, 3 trips to cordova (once/year) with journalism students	Deborah and Dan Morrison	Brenda sent email 1 August. Response 5 August from Julianne Parker, who is specifically focused on tribes and CC. Journalism project, they are documenting aspects of CC.		<p>debmor@uoregon.edu;</p> <p>danmor@uoregon.edu</p>			http://uoclimatereport.tumblr.com/contact

Institution	Name, Position	Last contact	Phone	Email	Location	Website	Notes
National Council for Science and Environment, Washington, DC	David Blockstein ,	Brenda wrote 7 August. Referred me to Teresa Newberry. They are collaborating on CC curriculum for tribal colleges. Brenda met Teresa 14 August.		david@NCSOnline.org			Worked with Teresa Newberry on CC curriculum for tribal colleges http://www.ncseonline.org/david-blockstein-phd
USFWS, Tribal Wildlife Grants	Kathy Orzechowski	Brenda spoke with on 14 August regarding potential tribal wildlife grant of Tatitlek	786-3645	Ak_twg@fws.gov			
Alaska Native Science Commission,	Patricia Cochran, executive director	Brenda wrote 5 August and 19 August	(907) 258-2672	pcochran@aknsc.org			
USFWS, Tribal wildlife grant contact	(Fred Armstrong retired) Larry Bell was his supervisor. Another contact is Crystal Leoneti, Tribal government affairs specialist, working with CRRC on migratory birds	Brenda called and wrote 21 July 2014	(907) 786-3887				
US Fish and Wildlife Service, Pacific Northwest Climate Change Collaboration	David Patte; Climate Change Coordinator	Brenda sent email 1 August. Response 4 August: <i>"I work for the US FWS down in Portland. I'm not sure who the best person might be for Alaska climate change issues of</i>	503-231-6210	david_patte@fws.gov	Portland, Oregon	http://www.c3.gov/	C3's efforts are focused in Washington, Oregon and Idaho. C3 is designed to complement other

		<i>importance to your Tribes, but you may want to call the Alaska DOI Climate Science Center. They are very interested in working with Tribes. See this website for contact info: http://www.doi.gov/csc/alaska/contact-us.cfm</i>					Pacific NW regional efforts and related efforts in Alaska, California, Hawaii and the Pacific Islands
Institution	Name, Position	Last contact	Phone	Email	Location	Website	Notes
Pacific Northwest Climate Impacts Research Consortium, Oregon Climate Change Research Institute	Philip Mote; Principal Investigator	Brenda sent email 1 August. Response 4 August: <i>"thanks for your interest in CIRC - and while we are keen to develop such partnerships, CIRC has a counterpart in Alaska that may be better able to collaborate. It's called ACCAP - accap.uaf.edu. There's also the Alaska Climate Science Center with DOI that is well positioned for such collaboration. If you draw a blank with those two, come talk to me again."</i>		pmote@coas.oregonstate.edu	Corvallis, OR		
Alaska Department of Environmental Conservation	Larry Hartig, Commissioner, Chair of the Climate Change Sub-cabinet. Attorney.			DEC.Commissioner@alaska.gov	Anchorage, AK	https://dec.alaska.gov/commission/	Commissioners "provide agency direction and administration and is policy liaison with the Governor's Office and Legislature."

Institution	Name, Position	Last contact	Phone	Email	Location	Website	Notes
USDA Forest Service, Pacific Northwest Research Station	Beatrice Van Horne		(541)-750-7357	bvhorne@fs.fed.us	Corvallis, OR		
Pacific Northwest Climate Impacts Research Consortium, OSU School of Public Policy	Denise Lach, PI and Sociology professor			denise.lach@oregonstate.edu	Corvallis, OR	http://oregonstate.edu/clasociology/denise-lach	
NOAA Climate Service for Alaska	Amy Holman, NOAA Regional Coordinator, or Gary Hufford		907-271-5334	amy.holman@noaa.gov gary.hufford@noaa.gov			
BIA Climate Change	<i>Sean J. Hart</i>		202-513-0337	<i>sean.hart@bia.gov</i>			
Chugach Alaska	Millie Johnson Vice President, Shareholder Development			<i>mjohnson@chugach-ak.com</i>			Contact to find out about individuals from tribes who may be available and skilled for job opportunities. Ida suggested.
Renewable Energy Alaska Project (REAP)	Shaina Kilcoyne Energy Efficiency Director	Terry Chapin has been in communication with Shaina, recommended her to Brenda	<u>907-331-7409</u>	<u>s.kilcoyne@realaska.org</u>			Within the Sustainable Southeast Partnership (SSP), she works on energy efficiency and

							renewable energy issues in Kake, Hoonah, Hydaburg and Kasaan
Alaska Native Knowledge Network	Ray Barnhart						
Marine Advisory Agent, Cordova	Torie Baker		(907) 424- 7542	torie.baker@alaska.edu			

Appendix III.
Report on conversations with agencies
Chugach Regional Resources Commission
Climate Change Adaptation Planning Project
Brenda Gail Bergman
Last updated: 12 September 2014

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John Mankowski. Coordinator, North Pacific Landscape Conservation Cooperative

2 September 2014

CRRC could be an Alaska co-chair or alternate chair on the NP LCC executive committee, John is open to this.

- We discussed the idea of a *practitioners' working group on adaptation and resilience* covering the Kenai and Chugach region that engages tribes and other agencies/organizations.
 - John would be willing to help fund and to help raise funds for this, even if it is for a sub-region of the LCC. He thought that the Alaska Climate Science Center may also be willing to help fund.
- A good training for adaptation planning is upcoming in October. Someone from a Chugach tribe may consider attending. <http://www.northpacificlcc.org/climate-smart-class-olympia->

19 August 2014

Tribal representation and engagement

- The LCC steering committee includes 5 seats for tribes, as well as federal and state representatives. Their current tribal representative for Alaska is Eric Morrison, who used to be with the Douglas Indian Association.
- The LCC also has sub-committees, and has an open approach to engaging tribes in these.

Upcoming opportunities for engagement

- On September 4th they are holding a tribal / first nation meeting in Washington State, following the 2nd and 3rd training on climate change being put on by ITEP (which Ida is attending). The meeting on the 4th will be a chance for tribes to talk with tribes, to discuss how the LCC is currently meeting needs, how they can do a better job, etc.
- **The NP-LCC is having an in-person Steering Committee meeting in Anchorage the first week of November**, and they welcome the participation of CRCC and/or member tribes. This is taking place in concert with the climate conference in Anchorage November 3-6
<https://csc.alaska.edu/events/climate-conservation-and-community>
- They are thinking about having a meeting of LCCs around the next Alaska Forum for the Environment. This would include a couple hour session for tribes to connect. February 9-13th.
- John is also willing to travel to meet with Chugach tribes. He would bring Eric along.

Communications

- The LCC has a list serve, which includes notifications about grants, meetings, etc. NPLCC.org
- Pacific Northwest Tribal Climate Change Network meets via conference call on the third Wednesday of each month. The Network provides regular input into ongoing research, resource development and general efforts of the Tribal Climate Change Project. To join the Network email list, email Kathy Lynn at kathy@uoregon.edu

Grants

- The LCC has a funding stream. The next call will come out around October.
<http://www.northpacificlcc.org/Resources/Funding>
They have funded several TEK projects, research on climate impacts on subsistence crops, and a study on berries in the Chugach region (This was mentioned in Nanwalek: "Berry Risk Mapping & Modeling of Native & Exotic Defoliators in Alaska")

John Morton. Biologist involved in Chugach Vulnerability Assessment, USFWS

22 August 2014

Coordination

- They haven't had good coordination with tribes, especially in the climate arena, but would like to. Their outreach with tribes has mostly been based on individual connections. He is disappointed that he didn't know much about CRRC.
- John would like to get people together to form a working group of practitioners, and would love to engage tribes in this. They would like to have a better connection with tribes in a proactive rather than reactive way, and would be happy to engage CRRC if we have interest.
- **An initial step would be to convene a small group of individuals who would function as a steering committee. For the Kenai Peninsula he knows most of the players, would be a 2-3 day workshop to get everybody on the same page**, lay out the science and modeling, have a common vision of what the world is moving toward. People are interested and concerned, but are struggling with what to do about it. Need to get the Borough at the table.
 - One idea for an umbrella that we discussed: forming a working group under the NP LCC. John is not so concerned with what the umbrella would be.

- The Alaska climate change round table is mostly on the executive level, they aren't the ones doing work on the ground.

Vulnerability and adaptation

- They've done a lot of work with climate, particularly regarding the effects of climate on natural resources.
- The vulnerability assessment underway extends from the Kenai through PWS into Cordova. They have also begun an adaptation assessment.
- They have done a lot of spatial climate envelope modeling, and have a pretty good vision of what the world will look like in 100 years. There are some major changes in the Kenai. Spruce bark beetle, drying wetlands, changes in fire regime, deforestation in the southern part of peninsula near Caribou Hills between Anchor Point and Homer, with grasslands returning. The latter is a major landscape change, and has shifted the fire regime. Because of these changes in the Kenai, the state has moved the fire season to begin on April 1 instead of May 1.
- The coastal rain forest is fairly robust against the climate signal, relative to what is happening on the western Kenai.
- **It's easier to come to agreement about vulnerability to climate change than to agree upon solutions. Adaptation takes a bigger dialogue.** Federal agencies themselves have different approaches to the same issue based on their mandates. These differences may in some ways be useful, particularly if we are sharing monitoring and evaluation to discern over the long term what worked. We have to move forward with adaptation efforts, because on the ground, people are making decisions every day.

11 September 2014 (meeting with Jeff Hetrick and Brenda Bergman)

- Adaptation can be considered in prospective or retrospective
 - In his opinion we should be thinking of retrospective, but be flexible enough to switch gears
 - Agencies are slow on adaptation work, John would prefer to work with others, such as tribes
 - Adaptation work has to come from the bottom up
 - The State has a fixed management regime, as if the ecosystems are fixed
 - Climate change is a directional change, as opposed to much ecological variability
- Consultation – larger agencies will just send a letter stating that a meeting is taking place, expect that if people don't show up it's their problem, the agency has done its part with respect to consultation. Clearly this is insufficient.
- CRRC and other tribal groups need to articulate what we want. If we articulate this to the larger forum, it becomes part of the process.
 - The USFWS is willing to partner with CRRC on proposals. Important components to any proposal: partners and scale
 - We should consider an intertribal venture for Alaska natives, need CC coordinator for tribes in the state of Alaska
- Local people need to learn how to engage in the political process.
- John and Dawn have been working on climate change since 2005.
 - John was co-chair of the "connecting Alaska landscapes into the future" program
 - The vulnerability assessment for the Kenai/Chugach is a collaboration between the USFWS, UA, and the Chugach National Forest
 - They envisioned the LCCs as a technical powerhouse of future scenario modeling, this is not how they evolved
 - NW Boreal LCC now includes Canada, is developing a synthesis paper

- LCCs are governed by a governing board. Every LCC is different because the board is different.
 - Each LCC has a manager and a science coordinator
 - The LCC model is a copy of the migratory bird Joint Ventures, because Dan Ash (FWS) was involved in their design
 - John thinks ~10% of the time LCCs should do what they deem essential, beyond what the board says
- With respect to climate change, he talks in terms of what is happening, not what is causing it
- The Kenai Peninsula is provided as a case study in the National fish, wildlife, and plants climate adaptation strategy.
- John does a lot with the Forest Inventory and Analysis Program. This uses a model based on the lower 48, but in Alaska it's important to engage federal land managers
- **Organizations funding adaptation work for wildlife: Defenders of Wildlife and the Dorris Duke Foundation.** If we move too quickly on adaptation without having a sound enough understanding of the implications, this can be dangerous.
- Climate change impacts
 - Homer area – grasslands where was once forest because of decimation by spruce bark beetle
 - Ed Berg's work with tree rings showed that spruce bark beetle is related to climate. There used to be an outbreak every ~50 years, triggered by two consecutive warm (dry?) summers, now these conditions are more frequent.
 - Depending on the choices you give the model, some forests on the Kenai will convert to grassland (based on scenarios currently present in Alaska) or to loblolly pine (when scenarios from the Yukon are also provided as an option).
 - The vulnerability assessment was primarily based on data from the UAF scenarios network models (SNAP)
- Next steps for adaptation. John is considering two potential actions:
 - A 1-2 day workshop on adaptation
 - The challenge here: can't get the State (DNR) to the table because of politics (the refuge is being sued by the state over an issue with brown bears). It's also hard to get the borough to the table, and they are important for any landscape-scale discussion.
 - John can put together a workshop, they are missing the tribal piece and so would be happy to engage CRRC with this.
 - An "environmental summit". This idea is supported by Robert Ruffner, Director of the Kenai Watershed Forum. Stacey Buckaloo (sp?) could be a facilitator.

Greg Hayward, USFS. Lead coordinator of Chugach forest vulnerability assessment.

22 August 2014

- The Chugach National Forest (potentially more than a lot of national forests) feels that one of the values of the forest is in education, so they want the assessment to be useful to people in the region.
- Geographic scope of the vulnerability assessment: The national forest, wildlife refuge, all of the Kenai and all of the Chugach through Cordova, expands north of Chugach to catch the drainage divide, includes whole Anchorage Borough.

- The assessment focuses on recreation and subsistence
- It has five primary emphasis areas:
 1. Ice and snow, including changes that are likely to take place.
 2. Salmon.
 3. 'Coastal seascapes', relates to the interface between people and the land, and the idea that a lot of the use of the Chugach is aesthetic.
 4. Vegetation this is a broad chapter. Includes expectations for longer term changes in the biomes (shift of the coastal temperate rainforest toward boreal forest), a focus on spruce, invasive species, rare plants, vegetation history of the region, disturbance processes like fire and insects.
 5. Wildlife, primarily addresses whether we should expect much change in moose, caribou, and sitka blacktail deer; also addresses shorebirds
- They also partnered with economists at ISER – institute for social and economic research, to discern what biophysical changes may mean for people in the region, especially economically for some specific themes including salmon, tourism, and fire impacts.
- Timeline: they expect the final document in early 2015. He will ask his peers about whether they can provide us with some summary information in advance of this. They include Steve Colt, an economist at ICER, and Monica at the Alaska Natural Heritage Program.

Terry Chapin, University of Alaska Fairbanks Resilience and Adaptation Program

14 August 2014

- Two of the main groups working to integrate native Alaskans in climate change - the AK Native Science Consortium and the University of AK Fairbanks Resilience and Adaptation Program - have lost funding, so their activities are currently at a low level.
- **They (RAP) would be interested in collaboration to develop a more sustainable movement that engages tribes in climate change efforts. They are open to working on joint grant proposals, etc.**
- Orville Huntington has been a helpful contact
- For renewable energy efforts with tribes under a Climate Change framework, a good contact is Shaina Kilcoyne s.kilcoyne@realaska.org

Mark Schildhauer, National Center for Ecological Data Analysis and Synthesis (NCEAS)

14 August 2014

NCEAS is compiling data from research conducted under EVOS. They prepared a summary of their data holdings for our review, which I sent to CRRC and to Eyak. I asked for a meeting with NCEAS to follow up on Eyak's interest in collecting additional pre-existing data that was not funded under EVOS.

Regarding Eyak's interest in collecting additional data:

- NCEAS has a well-established framework for organizing data. They could serve as a partner and bring this. They use "KNB" technology, and "EML metadata standard"
- In terms of human resource's required, NCEAS has hired technicians right out of their master's degrees. This could potentially be done with graduate students as well. Acquiring the actual data is the hard part.

- Regarding compiling TEK information into data - NCEAS has little experience working with qualitative data, but are beginning to delve into this. Important first steps toward compiling preexisting TEK (transcribed interviews) would be to establish metadata and keywords for each interview.

Regarding engaging tribes in ongoing natural resources efforts under EVOS:

- **NCEAS uses working groups to assess and use the pre-existing data collected. Working groups are formed around specific topics or themes.** They look at all of the data that has been collected and try to discern the bigger story. This reignites interest in existing data, and results in entirely new levels of insight. Working groups tend to be scientific / analytic. **If tribes would have an interest in participating in such working groups, we should follow up with Matt Jones about this.**

Steve Gray, Director of the USGS Alaska Climate Science Center and point of contact for USGS at the Alaska Climate Round Table; T. Scott Rupp, UAF Alaska Climate Science Center

27 August 2014

About

- The Alaska climate science center is one of 8 regional climate centers. Each one is a partnership between the USGS and group of universities. In the case of Alaska, the university partner is UAF. The mission of all CSCs is to bring to bear knowledge and expertise generated through research to address problems related to natural resource management. They are interested in connecting to what goes on beyond DOI holdings to address issues on a landscape scale.
- **Their priorities are set through ACER (the executive round table on climate change), and the LCCs (of which there are five in Alaska).** To address those priorities they bring in expertise and infrastructure from the UAF and USGS. At end of the day they are focused on understanding climate change and climate change impacts in a way that supports resource management and decision-making.
 - The priorities articulated by the Center's stakeholder groups at the regional level are 1) glacier change and impacts on ecosystems, especially fisheries, 2) scenarios of future vegetation, and what that might mean with respect to habitat availability.
 - One major focus is the development of climate models on the atmosphere to the soil horizon cryosphere, and everything in between. The capstone project is the 'Integrated ecosystem model' for Alaska and NW Canada, which is looking at vegetation dynamics, biogeochemistry, and permaculture dynamics.
 - Scott and the USGS have been involved in the Chugach Vulnerability assessment, as well as Steve McAfee.
 - One of the focus areas for the university's role in the Alaska Climate Science Center is training the next generation of scientists. They have a fellows program that sponsors students and post-docs. They seek to give young scientists an opportunity to integrate science and management, making sure that science is relevant and applicable.

Coordination and tribal involvement

- The Center's focus is on a regional level, and they mainly work with regional agencies. There's a growing interest at stepping this down to the level of a tribal community. **They want to hear voices from outside agency world regarding how to make their science useful. However connecting**

science to local-level practitioners has been challenging, including for the university. Everyone struggles with this issue.

- **Involvement in the LCC process is one of the Science Center's primary mechanisms for engaging with tribes.** Overall, tribal consultation has been tricky because of the way that different state and federal government approaches tribes. It has been difficult to come up with a logical approach to consulting with tribes. As a result the Center has had to mostly interface with consortiums, etc. through the LCC.
 - They are considering bringing on a tribal liaison. This person would sit in the climate science center office, would look for opportunities to take science and agency level decisions and step that down to what could be usable in villages.
 - They do occasionally have the opportunity to implement projects at the level of the tribal consortium. For example, they are involved in the project with Chugachmiut on berries and subsistence harvesting. These opportunities mostly arise through engagement with the LCC.
 - UAF is helping to coordinate the November Conference "Climate, Conservation, and Community in Alaska and Northwest Canada." They are bringing all 5 of the LCCs together. This will largely be introspective and science based, looking at work done to-date, rather than planning for expansion. There may be some excellent networking opportunities. They recommend that CRRC attend, but suggest that the conference is not designed well to engage the participation and viewpoints of new tribal authorities. A good approach for this would be via the LCC.
- Two other programs affiliated with UAF - ACCAP and SNAP- have additional experience engaging tribes and other stakeholders at a local level.
 - The SNAP program was established by the former University of Alaska president to try to do a better job at making information from science at the university available and relevant to stakeholders in the state. SNAP has focused on looking at areas of change for the state of Alaska. They have done a lot of work at downscaling climate models to local scales. Tools are available on their website, including lots of raw data that's used by the research community. The IEM project drives those models to look at potential changes and ecosystem processes into the future. The Chugach vulnerability project is a good example. All of the climate scenarios in that project came from the SNAP data. In terms of climate scenarios, SNAP is the only one that has done this.
 - ACCAP focuses on communicating science to stakeholders and getting feedback from stakeholders so that university science can be more relevant to local needs. They have a monthly webinar on climate change and natural resources. They have engaged with various groups including indigenous groups. For example they are working with folks on North Slope regarding sea ice, etc. Many examples are on the ACCAP website.
 - The UAF has a relatively new program called *Community Partnership for Self Reliance and Sustainability* that Terry Chapin and Todd Brinkman have been leading. The idea is to match needs identified by tribes / communities with technical expertise or resources at UAF. Communities discern needs and visions, then are connected with folks at UAF who may have the relevant technical expertise. This seeks to be a collaborative approach that is directed by the communities.

Michael Brubaker, Alaska native tribal health consortium, Climate Impact Assessments.

2 September 2014

Highlights:

- *Michael recognizes an ongoing need for mechanisms to link tribes with other agencies around climate change. Such mechanisms should recognize the value of local knowledge, and should help link information-holders with decision-makers.*
- *The LEO network is a repository of local climate change observations that CRRC tribes can refer to and contribute to.*
- *The digital story board consists of information from open discussions, rather than semi-structured interviews. Highlights are translated into a database.*
- *The Consortium has been active in the arena of tribes and climate change for about six years, and has insight valuable to future program considerations.*

Notes:

They started a center for climate and health about 6 years ago.

His perspective regarding priorities for future work with tribes and climate change:

- They look through the lens of health.
- Food security (which is closely tied to economics) is a big topic area for them statewide and for this region. Topics of related concern include changes in productivity of certain fish species, more vulnerability to disease (for example, the halibut ailments showing up), changes in seasonality and spawning success of salmon, storm events decimating shellfish, harmful algal blooms, the potential for areas that in the short or mid-term might be harder for fish to spawn or get up river, shellfish getting less tidal range, etc. In other regions, sea level change is an issue, with rebound happening.
- Other issues include navigation hazards, variability in snow pack, whether communities will have summer-long water resources if they depend on a reservoir, extreme events like wind storms and big fall storms.

In response to a question about the utility of a practitioners' working group for resilience and adaptation:

- Creating a place for people to share this in the region is important. Someone has to build the bridge between TEK, science, agencies, and tribes. There are so many different knowledge areas that we need to connect with. There is a need to direct resources back to communities. It's important to find ways where you can develop that conversation and keep it going. For example, you have to be able to call up a person who is a parasitologist about fish, understanding this is a trend, and get that information back to the community.
- The practical answers are coming from a local level.
- They (Alaska Native Health Consortium) have tried to create linkages with newsletters, outreach, etc. They've started a bit with the LEO network, trying to find regional organizations who want to be the lead in terms of technical outreach. People identify issues and put them on a map. But finding someone who can do outreach in the region is tricky.

Background on the LEO network:

- LEO is a network focused on unusual and extreme or unprecedented events. It relies on someone locally to say that something happened, this is important, how it is affecting us, what are people doing about it. LEO now has about 250 participants in 150 communities around AK. Mostly

participants are NRM managers, environmental managers, some Environmental Health Officers, and are affiliated with tribal organizations in some way. If someone wants to post an observation they send it in, it gets put onto a public google map. With that the Consortium can connect the observer with someone at an agency, to inform the agency that this is going on, and to request that they contact people at the local level to learn more about it.

- The network underlines the importance of local knowledge. One advantage in Alaska is that people are amazing observers, have been in their communities for generations. The research organizations, policy makers, etc. should be listening to what people are saying locally, should be driven by what is happening, what are the most important stressors. We are trying to provide tools for people to say this is happening.
- Method: We facilitate informal conversations rather than structured interviews. We then transfer key information to excel spreadsheets. One column may be extreme weather. Is it being observed? What kind is it? What are the potential implications for health? What are the data gaps? What adaptations people are using? Finish that line with a key observer quotation. What we are doing is based on TEK, although it's not TEK per-se. The information is useful if someone knows how to access it. When we put together assessment reports, return them to the tribal council for vetting.

**Kevin Illingworth, Carry Stevens and Byron Bluehorse UAF Tribal Management Program.
26 August 2014.**

Highlights:

- Core issues regarding a meaningful CC initiative for tribes in Alaska, which have arisen through CRRC, are also priorities for these UAF colleagues. They include the importance of addressing climate change through governance, and the value of collecting preexisting plans and information. Carry and Kevin are interested in collaborating with CRRC on a proposal to conduct symposiums on how to impact and engage with climate issues through governance.

Current activities

- We are beginning a new tribal management program to develop tribal NRM plans, which was influenced by Patty's inputs. The objective relates to empowerment, self- governance, and sovereignty with respect to NRM issues.
 - We are currently in the pilot phase. We are developing course curriculum that is hands on and participatory, and are providing technical assistance for each tribe to develop a tribal NRM plan. We've had two classes so far. The first course was an introduction regarding the nature and value of tribal NRM planning. The second course involved looking at the scope and design of the planning process. This fall students will do research on what already exists for their tribe.
 - This is a new model, many of the existing models are for reservations and Canadian first nations with land claims. Here in Alaska the plan revolves around 'traditional use areas,' and how tribes will interject themselves into management of natural resources.
 - All of the information is owned by the tribe so that they manage every aspect of the plan. It's taking time but the idea is to open it up to more communities.
 - In the past we conducted a technicians training, growing from conversations with Patty. The technician training wasn't successful because people didn't want to be technicians. People wanted plans. Many years later we were able to get funding, building on the idea.

- We only had six funded slots for this year. Identified people to fill those slots based on networking with tribal governments. Most participants are from the Aleutian region, aside from the participants from Nanwalek (the GAP staff).
- **We welcome involvement from Patty and CRRC specifically with respect to fisheries issues.**

Governance issues regarding tribes' capacity to manage for climate change

- We take a two pronged approach to address governance, given that Alaskan tribes lack land ownership: (1) educate people to understand jurisdictional issues, (2) encourage tribes to exert their jurisdiction.
 - Assume governmental authority over native allotments and start acting.
 - Take land use planning into account when making plans.
 - Identify laws and policies that tribes can use to influence their own communities. (Kevin)
 - Most tribes don't realize they can even enter into co-management agreements. They can be very worthwhile (although sovereignty is a better goal than co-management or participation) (Carry)
- One of our driving philosophies is the importance of the tribal government institution, nation building (along the lines of Native nations institute), to address any concern (including climate change).
 - Tribes have a great lack of understanding of the regulatory system within which they are functioning.
 - You cannot impact the regulatory process if you don't understand it. For example, tribes are not aware of how BLM lands are managed. How do they impact these plans, forest service, refuge, state lands? This is a huge gap. How do you understand the regulatory system that your traditional use area is within and how do you impact that? This will really come into play with climate change. See an issue but have no understanding of where in that to exert influence. (Carry)
- Consultation: Most state agencies don't think that tribes have the legal ability or capacity for self-governance. Federal agencies also would like to be accountable to the least number of people, in general. It's only individuals who are interested in consulting with tribes. When we get new people coming to Alaska they are more willing to work with tribes and to follow federal guidelines.
 - The environmental law institute has done some work looking at consultation. The very base issue is: are agencies consulting with tribes?
 - There needs to be a clear nexus to tribal governance, not just a tribal representative.
 - At the individual tribal level, issues are interconnected. Tribes are addressing issues most important to people in their area.

Corporations:

- Corporations end up being a core issue that the students struggle with, but need to be addressed.
- Most village corporation lands are the lands most valuable to people in the community. That was the basis of selection.
- The Chugach region has the most corporate shareholders in the state.

Mechanisms for tribal engagement in climate change efforts in Alaska. We were in alignment regarding the value of themes that CRRC has been considering for future CC work, including:

- Conducting symposiums on how to impact intergovernmental climate change issues through governance.
 - Bring land managers together, educate them on roles.
 - Address: How do you participate? What are the mechanisms? Who are the players? Carry will be teaching a class on these issues in the NRM planning course, probably this spring.
 - Start in the CRRC region.
- Starting to do work around bridging the tribal-corporate divide. We generally have to address it as a secondary issue even though it is primary.
 - The separation of tribal governance from the land is at the root of the issue. In some cases, tribes and corporations have come together, with massive land transfers from the village corporation to the tribal government. People want jurisdiction and governmental authority over the land. The relationship of people to their land will be different in each region.
- Gathering preexisting information and plans (as suggested by Eyak).
 - A major overarching issue is that tribes do not have reference lists or bibliographies of all of the plans and research that exists about them and their land.
 - This could be expensive and time consuming, but ideas include to model it on a subset of information (e.g. shellfish).
 - We don't need more data, we need to be able to use the data that exists. The amount of data for fish, e.g., in any one community is overwhelming. States can't even explain their extrapolation equations.
 - At the UAF, they have been struggling with getting the university to better make its data available to tribes and communities. The new vice chancellor – Yvonne Peter – is changing the way the university approaches research.
 - Tribes need tribal research agreements, with administrative and governance infrastructure.
 - Contacts at UAF for this: Department of Alaska Native Studies and Rural Development, or Todd Brinkman at Natural Resources.
 - If we wanted to engage grad students in a project that involves gathering preexisting information, usually plan for a year lag.
 - Kevin would love to see something where people are trained to be able to access research that relates to the communities.

- Bill Simion had done the best job of trying to collect existing data and to put it into data that can be used at the tribal level. An example of tribes' use of data locally: when Kevin was in Port Graham the NR manager at that time worked to identify two issues they were most concerned about: loss of darkies and access to eel grass right there by the community. Both used to be more available in the past. They made their own rules that you weren't allowed to freeze the darkie. Instituted a ban on use of grass.

Other suggestions included:

- Address infrastructure issues, which are Byron's focus.
 - Byron runs the tribal technical assistance program. He teaches GIS and long-range transportation planning. Climate change always comes up in terms of flooding, relocation. They are hosting 17th annual national tribal transportation conference in Anchorage. Helen Burrows is coming to speak at the conference, has done work on what will happen to infrastructure as the ice melts in the arctic.
- Approach this as an issue that brings people together, as opposed to the current climate that is somewhat 'us vs. them'
- Work within existing organizations rather than creating another entity.
 - Regarding the LCCs: The real benefit of LCCs is that they carry funding which tribes can apply for. UAF got some *because they were on an LCC committee*.
- Last year, the training for USFWS staff on working with tribes, several regulations were not correctly addressed. Let Carry know if CRRC would like help on governance aspects of this year's training.

Tina Buxbaum, ACCAP Program Manager

29 August 2014

Key points:

- Communities who benefit from ACCAP are those who contact the organization directly with specific requests.
- ACCAP will be writing their next five-year proposal to NOAA next summer. This is an ideal time to arrange partnerships that would be written in to the five year plan.
- In the meantime, ACCAP has some money to travel and provide talks, attend meetings. Inviting them for this is a good way to initiate a partnership.
- ACCAP is trying to make connections between science and people who need and can use the science.
- Ongoing projects:
 - We have an ongoing project called "current coastal change resource management projects and needs in western Alaska." This isn't addressing the Chugach region specifically, but looks at research needs from a science perspective
 - ACCAP also worked with SNAP on a community charts project and projections for different regions of Alaska. ACCAP helped put these into a usable interface.

- We also have a monthly webinar series, which covers a range of topics.
- How do decision-makers access information through ACCAP?
 - If a community comes to ACCAP and says they have a need, we try to address. For example, we recently put together a historical sea ice atlas so that communities, especially northern communities, can look historically at sea ice trends. That was driven by a community saying we want all this data in one spot.
 - ACCAP has better and worse connections with tribes in different regions. Better connected in Nome and Bristol Bay region. *Often connections are organic and dependent on people and interested in making connections in new regions.*
 - Much of ACCAP's work is also driven by the interests and projects of UAF research faculty.
 - ACCAP works with the LCCs a great deal, they definitely are a great way to make connections and get out there. Tina highly recommends using the LCC network.
- Other ACCAP services:
 - They have fair amount of infrastructure in place with web page and webinar infrastructure, partners can leverage those resources.
 - They have a food security expert who can work with organizations.
 - Being at UAF they are connected in with entire research infrastructure at UAF. They can access the UAF system and the UAA system.
 - Activities with a small scope of interaction, such as a workshop to talk about resources of ACCAP, they can do now.
 - We are always interested in making connections with people, that always fits into the ACCAP mission. We do have some money in budget to come talk on an issue, which helps to make connections.
 - Projects requiring a larger intensity of time/money require more planning
- The ACCAP planning cycle:
 - The organization is on a five year granting cycle from NOAA. When the new planning time arises there's lots of room for proposing new projects and ideas. They will write renewal grant next summer, while in their fifth year.

Keith Hatch, BIA

4 September

- The 2014 BIA climate change solicitation will be re-issued shortly, perhaps within the coming week, according to Sean Hart. If CRRC intends to submit a revised proposal, we should be sure to make this clear to the BIA. Otherwise the BIA may review the previously submitted proposal.
- Regarding unsolicited proposals:
 - For the BIA, contact Sean Hart about this.
 - In general, agencies often have excess money that they need to expend at the end of the fiscal year. Approach agencies for unsolicited proposals several months before the end of their fiscal year. If it's too close to the end of the fiscal year, it will be too late for them to establish contracts with those funds. Also, the time of year ideal for agencies to expend unsolicited funds is shifting, and can vary with agency.

Michael Cox, Michelle Davis, Santina Gay - USEPA Region 10

2 September 2014

Key points:

- **One tribal planning process that intersects with climate change is the GAP work plans, which can include CC components.** Michelle does training on incorporating CC into the GAP work plans, and is willing to help work further with tribes in the CRRC region. We could set up a conference call on this
- Michelle is interested in helping link tribes to village and regional corporations and universities on climate change, and would be interested in potential partnership on this.
- EPA Region 10 coordinates with tribes through the LCCs and through a tribal operations committee.
- The EPA would like to know from CRRC and others how they and other federal agencies can better coordinate with tribes. They also welcome success stories from tribes addressing aspects of climate change, which they would like to help promote.

Brief background

- Michael Cox – Michael serves as the EPA climate change advisor for region 10. He is based in Seattle. His job has two aspects: (1) trying to help programs figure out how they can integrate CC better into their existing activities, (2) reaching out more to tribes, states, and other communities to see how we can work together in terms of moving forward with respect to climate change. He has been doing this for about a year now.
- Santina Gay – Santina is working with the tribal program, has been with EPA for about 18 years. She administers the Indian General Assistance Grants. She is familiar with CRRC as a past GAP recipient. She also helps Alaska tribal office put together trainings during the AK
- Michelle Davis – works with tribes in SE and PWS on Gap grants, including some of the CRRC member tribes: Tatitlek, Chanega and Eyak. She works pretty closely with their staff. She helps the agency understand the impacts to tribes from CC, such as decreased water availability, and helps to incorporate this into program planning. She also works with tribes to develop CC components into their GAP work plans, develop a number of projects including the Tribal CC Funding Guide and a couple of publications, one on erosion, another on adaptation examples from around the. BIA funding that Sean has been administering, and then the new pool.

How the EPA engages with tribes on climate change:

- GAP funding / implementation plans
 - **Michelle does a fair bit of training at the CSC on incorporating CC into the GAP work plans. She is happy to help work with tribes in the CRRC region, we could set up a conference call on this.**
 - If tribes use GAP in a forward thinking way they can plan. Tribes can do a certain amount of proposal work with GAP. They can also do a baseline assessment (which could include things like shoreline being lost), and a vulnerability assessment. Before tribes can begin to respond they have to figure out how they can get the baseline info.
 - The new GAP guidance is mostly under air quality, and includes capacity indicators. There are a few indicators for climate change, under the environmental adaptation planning and vulnerability assessment.
 - GAP staff can't speak for the tribe, but can help make most effective connections. Only tribal leaders can speak on government-to-government level.

- Occasionally the ORD office has a solicitation process, recently one was awarded to AK native Health Consortium (for the LEO network).
- **The EPA also works through LCCs on how to better coordinate with tribes and understand their needs.** For the LCCs, Michael is on the committee that reviews proposals.
- Michael is also part of the **regional tribal operations committee** where they listen to tribes' needs.
- The task force formed under the president's climate change initiative will give some direction and initiatives that will provide guidance to some of the EPA's work.

Other ways to engage the EPA and tribes on climate change:

- The BIA is going to support a tribal liaison with the climate science center in Alaska, this will be beneficial. (Michael)
- Michelle **would like to get the tribal governments to partner with the village corporation to learn what resources regional corporations have and to reach out to the university, using a working group approach:** meet regularly, develop a funding strategy.
 - The ways to involve village and regional corporations has to come from tribal governments.
 - It's a lot of work to be the person convening these meetings.
 - Michelle has tried to establish a process of routine meetings to talk about climate change, make plans about who is going to take what steps. A regular, very business-like meeting.
 - Model is based on ICLEI model. ICLEI supported Homer to develop their climate change action plan. They met monthly, had fisherman, schools, etc. – this engaged people who do not normally work together. The tribe has to take on that work. She is seeing it come about in the GAP workplans.
- For each tribal community in Alaska, impacts will be unique to that tribe. There will be some regional similarities but the experience will be unique. There's a lot to be said for addressing your specific issues. No one agency has the resources to address everything.
- We have a quarterly call Alaskan tribes, though not so much on CC. We also often partner with ITEP (Michelle)
- The University of Alaska has some great conference calls from the climate center.

Arctic Council

- Santina is working from the 2000 foot level, helping to plan the upcoming U.S. chairmanship of the Arctic Council. The U.S. will be taking on chairmanship, which means a renewed focus in the U.S. on climate, with many resources. This work is taking place at the ministerial level, John Kerry. CC resiliency and indigenous projects will be a focus of the council for all of the 8 arctic countries.
 - They are currently setting priorities for the U.S. Currently the process involves responding to state department and other agencies regarding what EPA is doing with tribal resilience projects. The agencies put forward their projects, priorities, deliverables. The permanent participants also put forward their priorities. It's a pretty formal process. They are trying to find models for indigenous communities in other countries who are experiencing impacts.
 - Tribes are represented in the Arctic Council by a body called the 'permanent participants' – represented by their own member tribes. For example the ICC is one. The requirement is for the organization to have transboundary interest. ICC, as an example, is from the northern

tip down the coast of AK, working closely with Russia, Canada and Greenland. Another permanent participant group is Aleut International. The arctic council website is good, shows the mission of each, their membership, etc.

Ways to help the EPA help tribes:

- EPA colleagues would like to receive success stories. It's important for tribes to share the models that are successful and what doesn't completely work. It is important for tribes to have a forum to share what has been done. The EPA is always getting calls from agencies asking for success stories. It's nice to be informed of work that is happening, some CC work may be under a different label. Emergency response planning, e.g., could be because of increased storm surge and inundation because of climate change. (Michelle)
 - We would like to highlight work like this at our conferences. The Alaska forum for the environment coming up first week in February, we would like to package and put forward some of this work, for other tribes to learn about what is going on. It will be great to share materials. If they receive something nicely packaged, makes it easier to share with other federal agencies. (Santina)
 - Michael: it would be nice to have a common format for case studies. AK forum for the environment talked about how to highlight successes.
 - Michelle had a brilliant intern, Rachael Land, who prepared a publication called seven generations of self-reliance. IS a nice example of resources and some adaptation that.
- Michael: We would be interested in hearing what the federal family could do to help, specifically the EPA. Many tribes say that we are getting overwhelmed with everyone coming at us. How can we better coordinate?

CRRC tribes

- Michelle has only been the project officer with 3 CRRC tribes for a few years (Tatitlek, Chanega, Eyak). With this region, Tatitlek and Chanega are in a regeneration mode.
 - Chanega has had some challenges keeping environmental program staffed. Their water quality program was very good in the past. Chanega has asked the Chanega Corporation to administer their GAP grant.
 - She works with Ricky Komkoff in Tatitlek.
 - GAP is the backbone off Eyak too. Any other program they can build in is **all project driven. Will come and go in a couple of years in most cases.**

What are needs of tribes from your experience?

- Tribes would benefit from a pool of technical assistance - someone to help review grant proposals, to help support them, to ensure success, to support staffing and tracking, to provide a point of continuity during staff turn-over. They are always going from project to project. This issue is not specific to CC. When a tribe loses someone who is very good, it's like starting over. (Michelle)
- In the Chugach region, CC effects are subtle. Potential climate impacts from, e.g., ocean acidification and sea level rise will be harder to track in terms of what they mean for the community.
- There's almost an overload of information. She prioritizes based on the question: what are the most immediate impacts to human health, safety, and the environment? There have been huge disasters

from the Tsunami. If you have a 6m rise in sea level, what will a storm surge mean? If your snowfalls are becoming heavier and more condensed, what does that mean?

- For **planning, be as specific as possible**. That's where you start doing your outreach to corporations as partners. Some of the village corporations have 8A contracting, regional corporations have access to gravel, subsurface rights, may have equipment.
- The state of Alaska, coastal engineering department, has done some interesting work. They are looking at softer approaches to storm surge and erosion, for example building an embankment planted with beach grass instead of hard rip-rap. They are encouraging communities to do this work themselves. It also speaks to lack of federal resources, looking at other solutions.
- **Michelle has to do a site visit with Chanega or Tatitlek and would be happy to go along with someone from CRRC.**

Appendix IV
Summary of climate change training/seminars/webinars attended by CRRC Tribal Natural Resource
Program Director
Chugach Regional Resources Commission
Climate Change Adaptation Planning Project
Ida Hildebrand

JANUARY:

Ida attended the **Alaska Science Symposium** began **January 20 – 25, 2014** at the Dena'ina Center, Anchorage, **focused** on scientific studies & papers on **Prince William Sound** and changes since the Exxon Valdez Oil Spill.

FEBRUARY:

Focus on grant applications and submissions.

MARCH:

Ida also researched the **abstracts** from the **Alaska Marine Science Symposium**, January 20-24, 2014 for materials relating to **climate change impacts** studies in **Prince William Sound**, Lower Cook Inlet and the Gulf of Alaska, 254-page document; with applicable pages highlighted. She completed research files on **Adaptation Planning** and **Vulnerability Assessments** and the research report on **Managed Coastal Retreat** for climate change by Columbia Law School that focuses on beach erosion, moving dwellings and regulations regarding shoreline threats & relevant ordinances & law for coastal management.

APRIL;

Ida attended the **EVOS** affected **Community Based Monitoring** in Prince **William Sound**, and lower **Cook Inlet, April 3, 2014** at the Sea Grant offices, 1007 W 3rd Avenue, Suite 100, **Anchorage**. This session was preceded by an April 1-2, 2014 Workshop at the Hotel Captain Cook, which she did not attend. However, the issues covered included: **EVOS RFP** to be out in **2016** focused on **how to expend the remainder** of the **Trustee Council Funding** from the Exxon Valdez Oil Spill Funds. The interest is in **Community Based Monitoring; Data integration & Management** to have **public access** to all research; and sharing of data researched past & present. The **question** remains of **how to get around the funders interest** in the **big picture** that basically excludes **humans & local interest** on focusing on **local species/uses** that **impact local users**. The **RFP** requests a **funding plan** that will take the **Trustee Council** to the **end** of the **remaining funding**; and **leverage other funds** and **partners** to participate in the **plan recommended preferable** in a 5-year plan.

Ida participated in the **Alaska Tribal Climate Change Webinar**, **April 29, 2014** from 10:00 AM-11:30AM, presented by the Institute for Tribal Environmental Professionals (ITEP) & US EPA.

The **focus** was n **Protecting natural & cultural resources** & landscapes, managing natural & cultural resources using the example of the **Turok Tribes** 2 phase study. In **phase I**, they **collected & documented TEK** through community scoping & interviews with the data mapped by GIS, and **Phase II**, the analyzed the data & identified scientific information needs, data gaps & priority resources specific to climate change impacts. They summarized the data to inform future funding and research efforts, that could have been **Phase III**, but they called it a report. Notes available to Board on demand.

Ida **reviewed EPA Tribal grants** for **climate change**, and sought review of additional grants but had trouble with the EPA site; seeking clarification on contact persons. Jeff & Ida met telephonically with Kathy Lynn, Adjunct Research, University of Oregon Environmental, regarding the EPA grant and potential avenues to pursue. **January 22, 2014**. She listed the following as contacts: **John Mankowski**, and **Mary Mahaffy, Gus Bisbal**; and the **North Pacific Landscape Conservation Cooperative; Northwest Climate Science Center**; and the **Alaska Climate Science Center**. Also **Linda Kruger**, Tribal Liaison, **USDA Alaska Forest Service** 907-586-7814 or lkurger@fs.fed.us. The grant is up to **\$200,000** over a two year period. The grant application was **filed February 4, 2014**.

Ida has been working **reviewing articles** and other **Power Point presentations** regarding **Climate Change** in preparation for both the BIA & EPA Climate Change grants, although we have not yet heard back from EPA; according the research and presentations at the Alaska Forum on the Environment, we, **CRRC**, are **on track** with **focusing on outreach, public awareness and education**; and the creation of a **template** for our region that can also be utilized by other regions. Ida also participated in a **North Pacific Tribal Climate Change teleconference February 19, 2014** gathering information about current activities, tribal concerns and future training and webinars. Plans are underway to attend an EPA Climate Change training May 12, 2014 in Seattle.

MAY:

Ida, Patty, Jay & Jeff, attended the **EPA Climate Change training** May 12, 2014 in Seattle & Ida remained for the EPA Conference May 12-15. The focus was on process, applications, adaptation & vulnerability studies.

JUNE:

Ida attended the **Vine Deloria Jr. Symposium** at the **Northwest Indian College**, Bellingham, WA, July 9-12; The agenda **focused on Climate Change, Indigenous Identity, Tribal Governance & Tribal Colleges & Universities** as the hope for **Indian Higher Education and educational materials** from and **Indian perspective**.

Ida participated in a **webinar**, Climate Change: Impacts to Solutions, June 23, 2014 by **Cara Pike**, Executive Director of **Climate Access**. The session focused on **effective engagement** with **partners** that emphasizes local, current, personally relevant impacts that have bridges to local solutions; & the importance of **using local scenarios** to illustrate the local impacts.

JULY

Ida participated in the **PNWTCC teleconference** on **July 16, 2014** 9:00 AM -9:50 AM with focus on what is happening in climate change efforts, future webinars and trainings on Climate Change. **Kathy Lynn** UO Edu. announced that the **White House Climate change** new announcement **Fact Sheet** this morning effort to **help tribes prepare** for **Disaster Management**; and a **new bill** on **ocean acidification**. In addition the coalition **requested feedback** from participants on the **Guidelines for Traditional Knowledge** on **how to protect & incorporate it** into science responses and reports on **climate change**. Ida submitted comments.

In addition, the **USFWS Tribal Wildlife Grant applications** are **due September 2, 2014** and have room to **include climate change** work under these grants. The coalition is also seeking **Nominations** for **Peer Reviewers** on materials on **climate change**; and asks for nominations of self or others **by August 2, 2014**. The **Nez Perce Adaptation Plan** is available on their **web site** for download. The **BIA will soon** be releasing **funding** for **Important Assessments** on **Salmon** and issues related to **sea level rise**. A full report is available on Board demand.

Ida participated in a **webinar: Cultural Approaches to Positive Youth Development**, by Mary Cwik, NIEA, **July 23, 2014**, 10:00 -11:30 AM. The **focus** was on **Indigenizing surveys, assessments** and **curriculum** for Native Youth; with suggestions for local cultural involvement and choices for quantitative and qualitative assessments, multiple choice or open ended questions their merits and limitations; and incorporation of measures for mental, generational trauma, and other social behaviors of youth. It is mostly **focused** on **positive Native Youth Development** through cultural integration into programs for youth; how to evaluate programs; how to instill strength in Native youth through the following:

- **Caring Relationships** that include:
 - Role Models
 - Mentors
 - Leadership
 - Tribal history
 - Patience
 - Trust &
 - Safety
- **Meaningful Participation** through:
 - Providing a safe place for youth
 - Being inclusive of youth
 - Giving youth responsibility
 - Giving youth voice & choices

- Skills development
- Contribution to village
- Peer support
- **High Expectations through**
 - Belief restoration
 - Respect
 - Confirmation of youth
 - Guidance
 - Strength focus
 - Reframe issues

The **webinar also suggested** creating projects for youth that would involve groups of elders, youth, parents, adults working together to complete a project; learning songs, dance and other activities related to the project such as canoe building and all cultural aspects that go with that effort. **Youth Entrepreneurial Programs** that teach youth about business management, marketing, selling and financial literacy. See web sites:

<http://uwpress.wise.edu/books/0129.htm>

<http://www.oweesta.org/> or <http://www.tribalyouthprogram.org/events/webinar-youth-financial-education-curriculum-tools>

When collecting data and evaluating programs, decide what you will assess or evaluate – as family, individual, or community; historical trauma, stigma, customs, traditions or spirituality; and what means you will employ for that evaluation.

The **ITEP Newsletter** on **climate change** features **training** sessions, **webinars**; and **video** on climate change. This month their **video** featured **residents** of **Shishmareff** giving **testimony** in **Washington, DC** before Senator Whitehouse et al; (Indian Affairs Committee) They testified about loss of sea ice, melting permafrost; loss of language and resources; and impacts on sea mammals in their region that included loss of hair, sores, and tumors on sea mammals; and melting sod and permafrost lead to further shoreline erosion; in addition to loss of sea ice that amounts to loss of protection from sea storms and sea waves washing into their community causing loss of homes, infrastructure and resources. Resources are further away, harder to get to and more scarce. They also spoke of loss of shoreline where their children used to play and where they once harvested clams; which they can no longer do.

Ida participated in the **Brownfields in Your Backyard: Tribal Opportunity** EPA/ITEP **webinar**, July 31, 2014 by Dale Mitchell & Amy J. McKeown; on **EPA funding** and use of **EPA 104(k) ARC Grants** and **Section 128 (a) grants** to **clean up Brownfields** or **assess** or **investigate** them on **tribal lands**. A full report is available on Board request.

AUGUST

Ida also attended the Alaskan Plants as Food and Medicine Symposium at APU, August 7-9, 2014. This symposium **focused** on **Native foods, plants and medicines**; and traditional **ways of healing**. It is much **in line** with what we have **to identify** for future **climate change impacts** on our **natural resources** and **foods**. The list of plants as foods and medicines is quite extensive. Our climate change impacts and vulnerabilities need to list foods, plants, habitats that are vulnerable to climate change; and this symposium was quite helpful in listing these plants. The information was useful to our projects and **very affirming** of **Native ways of Healing**. This is an **annual symposium**; and plans are going forward to continue again at APU for 2015. A full report is available on Board demand.

Ida participate in a teleconference with the PNWTCCN Coalition, August 20, 2014. The focus was on **updating** webinars, training, and activities on **climate change** in the Pacific Northwest; we come under their EPA jurisdiction. The **focus** was on **Forest Service Models** for policy and programs; using an example from **Norton Bay, Alaska**. Contact information is available for potential funding for projects. Jeff Morris, Forest Service, **works** with **tribes** from Alaska to the East coast to **integrate rural/urban projects** with **climate change** adaptations; and to work collaboratively with all **natural resources** being **impacted**. (Ida – this **seems** like what **Seldovia/Chugachmiut** did with their **Berry Risk Mapping & Modeling project** for **Port Graham & Nanwalek**)

Kathy Lynn: stated that the **Nez Perce** and **Nooksak plans** on rivers & glaciers; are available on site for **examples of Adaptation Plans** by **tribes**.

Don Sampson: Affiliated Tribes of the Northwest, will hold a one **day workshop, September 21, Portland, OR, Wildhorse Casino/Hotel**, this is the day before their Conference, September 22-25, same location. They will address what climate change is; Review science/TEK impacts on tribes; and how tribes are doing their planning; identify funding opportunities. 2-5 PM

Julie Maldonado, updates on **First Stewarts Symposium** July in Washington, DC; this was begun in 2012 and the 2014 symposium was a follow up to the 2012 **white paper** report. Witnesses testified on climate change impacts from their respective areas; and the **2014** also developed a **white paper** in response regarding **climate change impacts** on **Traditional places; culture** and **food security; adaptations** to climate change; and **solutions** on how to move forward; how to **connect** with **Policy makers**. Basically a white paper on what is to come; and

Rising Voice Workshop, July 3rd in Bolder, CO. This was the second meeting with the first in 2013. They had about 70 participants both Indigenous and non-Indigenous. It was a **workshop**. They worked on **outcomes & recommendations** by **tribes** to be considered in the fall; and will send a copy of the report to network members when completed. The **Congressman** from **Arizona** also a member of the **Energy Task Force** requested a copy as well.

Kathy L: updated the **California LCC** is **seeking input** from **tribes** on efforts in **management** and **Science to integrate natural resources** and **climate change** tribal efforts; and invites tribes to contact them. Contact information available on web site for Climate-Smart Conservation planning.

She also reminded everyone of the **September 2-4 Portland, OR training**; and the **September 9-10 Seattle, WA climate change conference**. Plus the tribal meeting following the Portland training that focuses on tribal input and TEK. Finally she spoke of the **Technical Guide** for **grants** and **agreements** that can be downloaded onsite.

<http://www.fs.fed.us/spf/.tribalrelations/documentns/tools/StartPartnershipTribalGuide.pdf>

The USFWS **TWG grants** are due **September 2, 2014** and can include **climate change** projects as part of the grants.

There is an **Indigenous Symposium, December 2-3, 2014** in **Oregon**.

Teleconference **Q & A:**

Are there projection models that can be down scaled to show local impacts on precipitation that we can use to being to create our database?

Paul, NW Climate Change Center: It **depends** on your **focus**; like spring flooding; summer floods etc; and that would be **Eric Salital**, he is who you need to contact, but we can talk after this teleconference to get your specifics and to make recommendations on who to contact.

Kathy L: I'll send the contact info to all.

Jason: Pretty Bay, EcoTrust, we **also** have **information** to share with tribes to help with climate change questions; information already published; summarized data or more primary needs;

SEPTEMBER:

Although September 1 was a holiday, Ida traveled for **trainings** in **Portland, OR, September 1-5, 2014**. This was the **Pacific Northwest Climate Change Adaptation Workshop** followed by the **North Pacific LLC Tribal Meeting**. The former workshop was conducted by the Inter Tribal Environmental Professionals (ITEP) & and latter by the Columbia River Intertribal Fisheries Commission. Both **focused** on **tribal issues** and **involvement** in **climate change planning**, and **management**; with a **need for tribes** to be **at the table** were **policy & other decisions** are being **made**. Tribes agreed for form a **tribal committee** and **agenda** for tribes to **meet before** or **after** the **LCC meetings**. The next tribal meeting will be in **Anchorage** in **November 2014** following the NPLCC meeting that includes all other Alaska LCCs.

Ida also read **Climate Adaptation & Action Plan for the Norton Bay Watershed**, Alaska, Norton Bay Inter-Tribal Watershed Council, Norton Bay, AK, December **2013**. Very well done and can be

used as a **template** for our own CRRP Plan; research on climate change background, Alaska tribal issues, climate impacts for the north are relevant to Prince William Sound. This document was part of the background reading in preparation for the Portland training.

Ida traveled from Portland to **Seattle** to attend the Pacific **Fifth Annual Northwest Climate Science Conference, September 9-10, 2014**, but stayed in Seattle from September 5th to avoid the added costs of flying back to Alaska and then back to Seattle. She completed the reports on the Portland training during this time. This focus of this session was to **incorporate Traditional Knowledge** with **western science** in addressing the **impacts of climate change on tribal lands**; giving and using **scientific papers, methods, models**, and **localizing studies** to be **applicable to local scenarios**. The majority of presentations were the synthesis of hundred of studies and summarized for this conference. All presentations will be available in two weeks via email.

